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A Magazine of Horticulture, Botany
and kindred subjects.

CONDUCTED BY

THOMAS MEEHAN,

FORMERLY EDITOR OF THE "GARDENERS' MONTHLY," AND AUTHOR OF THE "NATIVE FLOWERS AND FERNS OF THE UNITED STATES." VICE-PRESIDENT OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA. BOTANIST TO THE PENNSYLVANIA STATE BOARD OF AGRICULTURE, ETC.

ASSISTED BY

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Volume VI.
1896.

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Preface to Volume VI.

ALL NATURE is a series of advances and rests. We work by day and sleep by night. Plants and flowers have no diurnal periods,—but they rest and advance all the same. Their whole growth is in rhythms. A little movement,—a greater swell—a gentle passage to rest. Then comes a renewal, many times daily, with its corresponding rest.

And we, who treat of flowers, have our advances and our resting times. We start when the year opens,—go merrily along, rhythmically from month to month, till we reach our December resting period, when the literary flower presents to the reader its ripened fruit.

It remains now only for the reader to gather and store the product on his library shelves. We believe our work has been useful and will be a fund of pleasure for all time. We close the volume, in this feeling, with pleasure, and with renewed life and energy for another year's experience.

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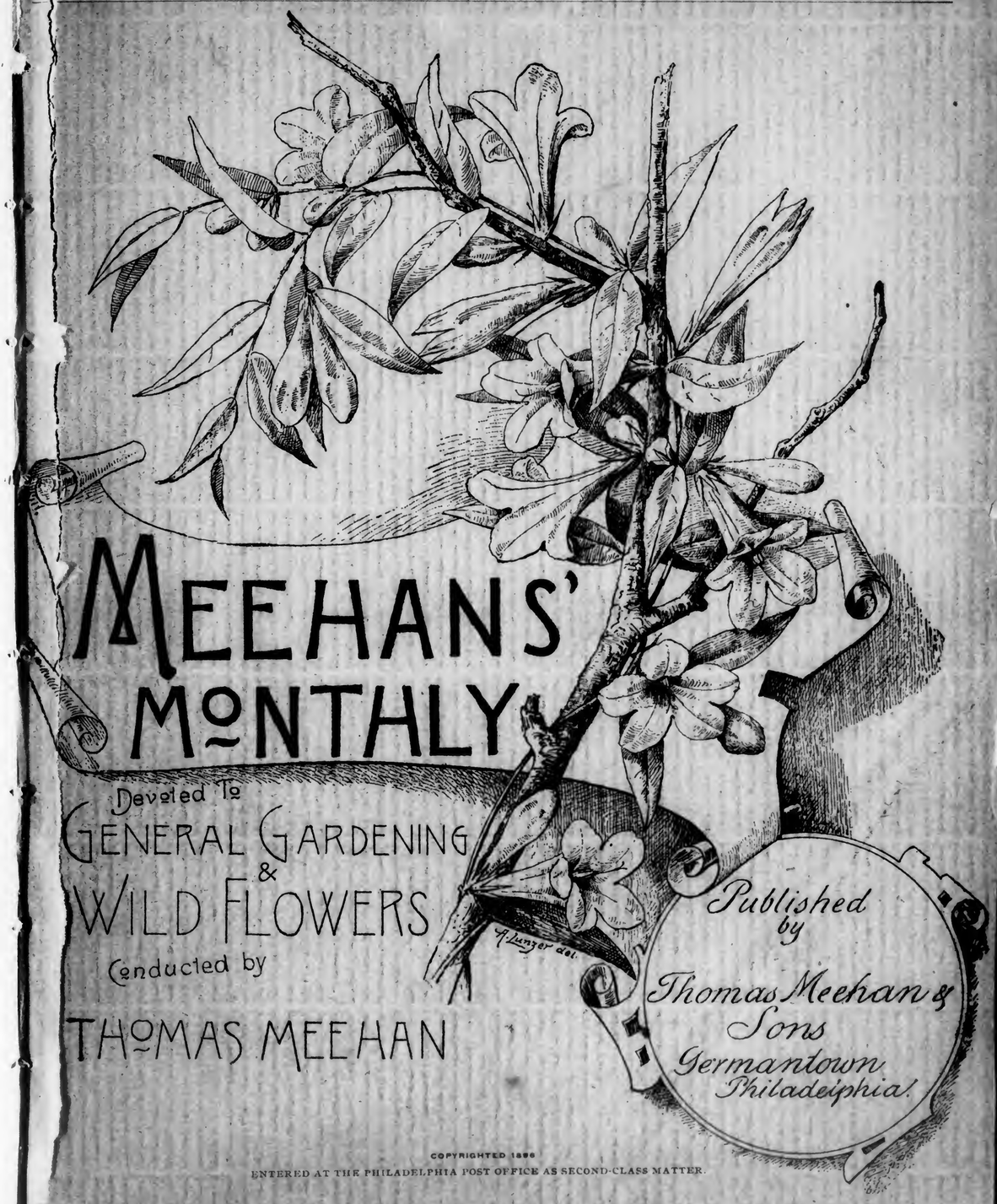

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THOMAS MEEHAN

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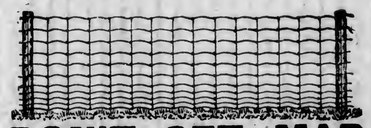

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LIPARIS—LILIIFOLIA

LIPARIS LILIIFOLIA.

AMERICAN TWAY-BLADE.

NATURAL ORDER, ORCHIDACEÆ.

LIPARIS LILIIFOLIA, RICHARD.—Leaves two to six inches long, elliptic ovate, spreading, shorter than the scape. Scape three to six inches high, angular, the angles often margined. Flowers rather large, in a loose, oblong, terminal raceme; lip as long as the straw-colored perianth lobes, cuneate-obovate, abruptly acuminate, brownish-purple. Capsule oblong, angular, about three-quarters of an inch in length. (Darlington's *Flora Cestrica*. See also Gray's *Manual of the Botany of the Northern United States*, Chapman's *Flora of the Southern United States* and Wood's *Class-Book of Botany*.)

There are numerous flowers that the popular mind would not esteem beautiful. Too often beauty is merely the gay. If a plant have showy flowers,—flowers with rich colors and which press themselves on our attention, it is rare that the mass of the people do not pronounce them beautiful. But those who understand true beauty see it in numberless ways not vouchsafed to others to see, and enjoy true beauty where others would only see a bank of weeds. An unknown English poet truly expresses these sentiments in a pretty fugitive poem called "Sunshine and Shadow."

"Only a bank of weeds, of simple weeds,
Of sweet wild thyme and yellow scented broom,
Of tangled grass and slender wind-blown reeds,
Of brown notched ferns and tall spiked foxglove bloom,
And yet a world of beauty garners there,
Low twittering birds, soft scents, and colors fair."

Those who interpret the gay as the beautiful, will not admire our American Tway-blade. It will not be found among the bright ornaments of the flower garden. But those who can appreciate the poet's bank of weeds, and the many beauties garnered there, will assuredly not miss this. On moist banks in shady woods, among the dead fronds of ferns and the decaying leaves of the protecting trees, it finds itself at home. Frequently it seems to be growing in this mass of mouldering vegetation rather than in the earth as other plants are found. It grows more or less abundantly all over the Atlantic portion of the United States, that is to say, in most of the territory east of the Mississippi River, and always in these shaded woodland situations, as far as the writer of this is aware. It is remarkable that it is seldom found in any large quantity in any one place, a circumstance common to many other orchids, notwithstanding the many thousands of seeds which mature in each seed vessel. Occasionally cases are met with where numerous small plants, evidently seedlings, surrounded a few old plants. Really, almost all plants of orchids with a habit of growth like this must have originally come from seeds, as they multiply very little by root division. As we see in our illustrations, Figs. 1 and 3, there is an old bulb bearing a dried flower stem, and from this bulb, a shoot bearing the flower of the present year. A little later the old bulb (Fig. 1) will dry up and disappear, its substance going to nourish the whole foliaceous and floral structure of the new growth, which has no roots of its own. After having been thus nourished from the parent bulb, and gone so far as to mature its seed vessels, a new bulb is produced at the base at Fig. 3, which in turn sustains the whole growth of the ensuing year. There is rarely (if ever) over one stem a year,—so that on this principle the bulb of to-day, producing but one other each year as the old one decays, would yet be represented by but one bulb and one flower scape even a hundred years to come. Fairly presuming that this has always been a character of the plant, the plants, everywhere common, must have originated from seed and not from offsets. The conclusion from all the facts is that it requires a very nice co-operation of circumstances to produce conditions favorable to the germination of these minute seeds. Further, when we consider how widely some of these species are distributed, and how rarely their seeds grow in these days, we may assume either that the world is enormously old, and the plants have slowly progressed over the continent through

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the long ages,—or else that the conditions favorable to the germination of the seeds have changed in modern times. Mr. Darwin indeed adduces good reasons for the belief that all orchideous plants are very old inhabitants of the earth,—that many forms have wholly disappeared,—and that those which have come down to us have been wonderfully changed through a long course of slow modification.

As already noted, an immense number of seeds are found in one seed vessel; but in the *Liparis* as found about Philadelphia, very few of the flowers produce any seed vessel. In the specimen illustrated, the old spike is drawn as it occurs naturally, mature at about the same time that the flowers of the present season appear. It has perfected but one seed vessel, (Fig. 4) all the others having fallen as the flowers faded away. In order to ascertain how far this tendency to infertility prevailed in the region referred to, twenty-five plants, taken at random, were marked, and the number of flowers and final seed vessel, on each spike, noted. On four spikes aggregating thirty-six flowers, not one capsule matured. On six spikes with sixty-two flowers, only one each, as in our illustration. Three spikes, with fifty-four flowers, three capsules each. Four with one hundred and six flowers, four seed vessels. And two spikes, of thirty-one flowers, five each. The last was the greatest number found in any plant outside of those marked. There were altogether fifty-six seed vessels from three hundred and seventy-five flowers, showing that in that number about six flowers were infertile for every one that matured seed; and this good average only through a few fortunate plants, as fifteen plants out of the whole had no seed, or at best but one or two seed vessels. These peculiarities in orchids are often attributed to circumstances connected with the subject of cross-fertilization through insect agency.

It has been difficult to decide on the best English name to adopt for our plant. Professor Gray and other botanists employ the same name for two different orchids. In the *Manual of Botany*, "Tway-blade" is given to *Listera* as well as to *Liparis*. In this chapter, an attempt is made to distinguish them by adding "American" to this species, as it is wholly an American plant, while the *Listera* is also a native of Europe, and the genus to which the original "Tway-blade" properly belongs. The name is a very ancient English one, and even old writers refer to the two leaves for its origin. It may, however, be remarked that many English plants have a pair of leaves only, and might suggest this name as well as the one which seems to have secured it. The *Listera ovata* has, besides the two leaves, the lip of the flower divided so as to represent exactly two blades of a knife, united at the base. It is really a "double" or "Tway-blade." How far this may have influenced the original appelation, it is not possible now to say.

The two-leaved character is not always constant. As we see in Fig. 3, there is a green sheath under the pair of perfect leaves. Salmon, writing in the days of Queen Anne, says of the original "Tway-blade," "sometimes it will have three leaves, but it is very rare; and this, some account to be a different sort, but is rather looked upon to be *Lusus Naturæ*, in ground which abounds with too much nourishment, which happens also to many other plants." It shows the fact has been long known, however we may differ from the explanation. Gronovius, the editor of Clayton's early collections in Virginia, notes the same "*Lusus Naturæ*" of our present species. He says "the two leaves are erect, shining and veined, appearing like plantain leaves, convolute at the base, and sometimes with a lower third one, but always very small." Why leaves are sometimes suppressed, and at other times developed, is not yet clearly known,—but there is reason to believe that it is the reverse of the explanation suggested by Dr. Salmon. All the floral parts of a plant are made up of parts which, in their earliest microscopic stages, were designed to be leaves. It is a higher effort of vital power which unites parts as flowers, which under a lower power would be free as leaves; and the power to make the best use of nourishment is the attribute of strong vital power. How this law works may be seen in Junipers and other coniferous plants. In the Red cedar the more vigorous branches have the leaves united with the stems. In the weaker branchlets the leaves are free, as in species generally.

EXPLANATION OF THE PLATE.—1. Bulb of last year. 2. Mature flower-scape of the preceding season. 3. Growth with flower-scape of present season, yet to form the bulb. 4. Only seed vessel, maturing on last year's scape.

WILD FLOWERS AND NATURE.

FLOWERS OF THE SOUTH.

He told of the magnolia, spread
High as a cloud, high overhead;
The cypress and her spire;
Of flowers that with one scarlet gleam
Cover a hundred leagues, and seem
To set the hills on fire
—WORDSWORTH.

HISTORY OF LIPARIS.—In addition to what has been said in regard to *Liparis liliifolia* in the chapter accompanying the plate it may be noted in connection with the genus itself that in the writings of the earlier botanists, *Liparis* plant will be found classed among *Ophrys*, a name given by the ancient Greeks to some species of orchid, and retained by Linnæus to designate a genus in which he included this. When more became known of orchideous plants the genus *Malaxis* was formed, and in this genus our plant will be found in the botanical literature of the earlier part of the century. When still more knowledge was gained, Richard, a French botanist, established the genus *Liparis*, and our plant became *Liparis liliifolia*, that is, the Lily-leaved Liparis, Those who are familiar only with the slender stem leaves of lilies will not see the resemblance; but the root or autumn leaves of some lilies, especially *Lilium candidum*, are broad, thick and shining, and the leaves of our plant have some resemblance to them. The generic name, *Liparis*, was suggested by the shining, fat-looking leaves of the European plant, *Liparis* being Greek for fat or unctuous. Clayton, the botanist, who noted it first as growing in Virginia, makes the annual record of the date on which he found it, May 24, 1874.

THE FERTILIZATION OF CLOVER.—The *Hartford Times* has the following:

"The theory that the bumblebee fertilizes the clover blossoms has often been asserted and the Australian importation of that insect for such purpose has been cited, as an example, that one must hesitate to contradict these statements. Yet they are improbable and erroneous when one considers the working of the insects on the clover heads, whose numerous little florets are exact pea-blossoms, with a large tube and self-fertilizing organs, into which the insect thrusts its long proboscis to draw out the secreted honey; and she need not pierce the florets, but can, and does perfectly well, reach the sweets from the outside, as in the columbine, the foxglove and the pea, which she riddles when at work on them. Careless acquiescence has too long permitted the continuance of this idea. To ascertain correctly the truth about it, needs further attention and investigation."

This is another illustration of the danger to real science by broad generalizations from a few isolated facts. Mr. Darwin covered some clover so as to prevent the bumblebee from reaching the flowers, and few flowers produced seeds. No one is recorded as repeating such a simple experiment in the Old World. The whole of the great generalization about the necessity of the bumblebee in clover fertilization rests on this one little observation. But in America men just as reliable as Mr. Darwin have covered clover in the same way, when the plants were just as productive as uncovered ones. These facts have been placed on record in the publications of eminent scientific societies; but the fame of Mr. Darwin overshadows them all. It does not follow that the results reported by Mr. Darwin were incorrect. But it does follow that some other cause, and not the absence of bees, brought about the infertility in his case.

The facts are, as stated by the *Hartford Times*, and as any one who will take the trouble to watch will see, that American bumblebees slit the tube of the clover flowers, and gather the sweets in this surreptitious manner. They seem to prefer this method with most species of plants except those that fully expose their nectaries. Clover requires some check to growth before it seeds freely. In most parts of America the weaker second crop is depended on for a cup of seed. The clover is a self-fertilizer, and bees have no part in the work.

HOW DOES THE SWALLOW BUILD ITS NEST?—In the MONTHLY for November, Edwin C. Jellett says "the glue which lines the nest of the chimney swift is of vegetable origin." I would like to ask through your valuable magazine whether anyone has ever detected the bird in the act of gathering the "gum of the cherry or the peach"?

In many parts of the country these birds are quite common. Certainly abundant enough to have been observed gathering the materials from these sources if that is the origin of the glue that holds the twigs together. I once found the nest of this species in the Adirondack Woods, in the second story (attic) of a logging hut, five miles or more from any other building.

The species is abundant throughout Central and Northern New York State, and probably not less so throughout Pennsylvania, so the opportunities are everywhere present. Thus far I have not observed any such proceeding as would be necessary to secure the gum of the cherry or the peach. Dr. Warren says, Birds of Pennsylvania, pages 182, 183, "The chimney-bird, unless resting on its nest or clinging to the sooty chimney sides, is always seen flying."

It even gathers the materials for its nest, as far as the twigs are concerned, "by breaking them off trees when on the wing." It nests with us in barns occasionally; usually high up in the gable of a large barn, against the perpendicular face of a board. This was the site of the nest in the Adirondack cabin.

Has anyone ever seen these birds gathering anything besides sticks and food?

M. W. VAN DENBURG.

Fort Edward, N. Y.

If the bird in question is not the Barn Swallow, what did Chimney Swallows do before there were chimneys? is one of the questions well answered by Dr. Van Denburg. What they have done or will do when they cannot get gum, will doubtless be just as little puzzling, when we know all. The writer of this paragraph has not seen the chimney swift gathering the gum,—but he did see the lump of undissolved cherry gum in the bird's nest referred to. How they dissolve it may yet be a question.

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To break a twig while flying rapidly would lead to a pulling of the twig rather than a snapping asunder,—and it would seem that the bird would be in more danger of breaking its neck than breaking the branch. But if any one has seen it done let him come forward and tell how the bird did it.

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"The north wind passes overhead, and the sunlight creeps among the old oaks as if expecting to find me. It does, and we laugh together. Summer had left an abundance by which to remember her. We call it winter fruit; but it was the deft fingers of summer that shaped the bright red berries of the Black Alder which now replaces the Scarlet Lobelia that in August blazed by the brookside. Then, too, there were ruddy hips, and over the ground the golden fruit of the horse-nettle. The privet, laden with black berries, was still green, and the rhododendron and sassafras sprouts were fresh as a bright June morning, and beyond, the gaunt trunks of the walnuts were draped with climbing Bittersweet, glowing with its wealth of crimson and gold. All this, with abundant sunshine—what if it is December? It would be safe to wager there were flowers yet in bloom, I thought, and straightway found dandelions starring the dead grass."

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"One damp day recently, when in the woods, I was a good deal puzzled by noticing in the air a delightful fragrance, of more than ordinary sweetness. It being late in the season (November), I saw no flowers near except an occasional belated aster or goldenrod and the witch hazel, none of which I supposed were odorous. On arriving home and opening my tin collecting case, in which I had placed some flowering twigs of witch hazel, I was greeted with a veritable burst of perfume from them. They retained their fragrance for some time in the room. Is it generally known that these blossoms are fragrant? I had never noticed the fact before."

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"The milk weeds are a large genus with us. I note the *Asclepias Cornuti*, the most plentiful; the delicate *quadrifolia*, the *tuberosa*, *purpurascens* and *incarnata*. The *verticillata* may also be found, I believe, by earnest seekers. I find that the *incarnata* has especially large seeds; and that the *tuberosa* has very handsome pods as well as beautiful orange flowers.

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As for the silk weed, the school children strip the pod away to get the unripe column of seeds and use it in their play as a fish. It corresponds very well to a spindle-shaped fish, and the flat seeds are a splendid substitute for scales. Homeward over the hills one autumn evening I saw groups of its stalks bearing the splitting pods. The outflow of the mass of seeds and down was in beautiful and regular order, for the day had been still, and they looked so soft and tempting to the touch that I grasped a bunch of the silk, and to my surprise found it quite warm, though the sun had set."

THE KENILWORTH IVY.—Mr. Isaac Myer, New York City, says: "In your MONTHLY for December, 1895, page 232, you say, the *Kenilworth Ivy* is a kind of snap-dragon and its name is *Antirrhinum Cymbalaria*. I have a great amount growing but have always classed it in the order *Scrophulariaceæ*, in which are the *Antirrhinum*, but under *Linaria* and have labelled it *Linaria Cymbalaria*. It is sometimes called by the following names, Ivy-wort, *Linaria repens*, Mother of Thousands, Ivy-leaved Toadflax, etc. Will you kindly inform me if I have been wrong in calling it a Toad-flax and not a Snap-dragon?"

Linaria differs from *Antirrhinum* in having a long instead of a short spur. The Kenilworth Ivy is therefore critically a *Linaria*.—and *Linaria Cymbalaria* should be always employed, as our correspondent well suggests. Indeed it is very often known by this name, and the other referred to the list of synonyms.

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INTENTIONAL SECOND EXPOSURE

VARIATION IN ANNUAL CLIMATIC CONDITIONS.—The Girard Estate, in Schuylkill Co., Pennsylvania, which is one of the supporters of the Girard College, in Philadelphia, has a water station which supplies some of the mines in the surrounding country with water. Very careful figures are kept, and it is remarkable how the quantity of water falling varies from year to year. In 1886, the precipitation was thirty-six inches; in 1887, forty-eight; 1888, sixty-two; 1889, seventy; in 1890, sixty-four; 1891, sixty-two; 1892, forty-nine; 1893, fifty-nine; 1894, fifty-four. The fractions are not given. The difference between one year of thirty-six and another of seventy is very striking.

GREEN SPROUTS INSIDE FRUITS.—"The germinating of an orange seed within the orange is not a rare occurrence. The writer has frequently met with oranges and lemons in which the seeds had germinated and developed a young plant within. It is caused by defective nutriment in the parent tree. The fruit is always found defective, the little sacs which contain the juices of a perfect orange or lemon are always abortive being changed into fibrous matter and very bitter. The oil sacs in the rind were also defective or absent.—The writer has found the same abnormal development in the seeds of the *Calystegia Sepium*. Walking on the seashore north of Cape May, the writer noticed the seed vessels of this vine larger than usual. Opening the vessels the seeds were also much larger than usual and of a pale brown color instead of black. Removing the pericarp a young plant was found within, and by carefully unfolding, the cotyledons were found fully developed and about the normal size, of a pale green color. The albumen had all disappeared, being consumed by the young plant.

The actinic rays which develop the chlorophyl in the plant having the power to penetrate the leathery texture of the seeds of the *Calystegia* would also penetrate the defective rind of the orange and lemon. The primary cause is probably an abnormally high temperature and a very humid atmosphere."

P. K. SULOFF.

Philadelphia.

The whole subject of the formation of color in darkness requires going over by a careful epitomist. Many fruits produce green cotyledons in their little seed-prisons certainly in total darkness, though until a few years ago, no one recorded it. Some one had a paper before the American Association for the Advancement of Science, not half a dozen years since, in relation to the common Bittersweet, *Celastrus scandens*, having green seed-leaves or cotyledons inside the fruit. It was thought exceptional. But it is now known to be comparatively common. The garden Phlox, varieties of *Phlox paniculata*, are examples readily secured for illustration.

AMERICAN MISTLETOES.—The American mistletoes differ from the English mistletoe in the independence of the sexes. In the European the male and female flowers are all on the same plant, hence berries may be found on every plant. In America each sex labors for itself, and goes its own way on separate plants, and hence there are many plants wholly barren. Neither are the berries as large as the European sorts, following a general law that in allied species, as in the sweet chestnut, the fruit is always smaller in allied American kinds. On account of this difference in the behavior of the sexes, botanists make a distinct genus of the American,—*Phoradendron* instead of *Viscum*,—*Phoradendron* signifying a thief on a tree, its parasitic nature being referred to. Like its European brother, it is found on any tree frequented by birds that use the berries for food. In Delaware and New Jersey the persimmon and tupelo are mostly its unwilling hosts. Along the Potomac it is common on the Water Elm. It is rarely found north of New Jersey, and scarcely reaches Illinois; but there are other species which take its place. In western Nevada we again strike our friend from the East, though slightly modified by larger leaves, and the plant gets more and more abundant until it reaches Southern California and New Mexico, and, running into Texas, changes to forms bearing pink berries as well as white. One of the most remarkable of the Pacific Coast species, however, has leafless branches; but the round, cord-like stems are succulent. This usually grows on the western cedar trees, which, covered with white, waxy berries in the winter time, make naturally trimmed Christmas trees.—Philadelphia *Public Ledger*.

GENERAL GARDENING.

JANUARY.

Then came old January, wrapped well
In many deeds to keep the cold away:
Yet did he quake and quiver like to quell,
And blow his nayles to warm them, if he may,
For they were numb'd with holding all the day,
An hatchet keene, with which he felled wood,
And from the trees did lop the needless spray.
Upon a huge great earth-pot steane he stoode,
From whose wide mouth there flowed forth the Romane flood. —*Spencer's Faerie Queen.*

BORERS IN STREET TREES.—Mr. Lewis Collins, the secretary of the eminently useful Tree Planting and Fountain Society of Brooklyn, New York, gives the following instructions in relation to boring insects, so often destructive to street trees:—

"Borers are much more injurious to trees than leaf-eaters, and are much more difficult to control. There is a great number of kinds, and they may be found in every part of the tree, from the smallest twig to the largest trunk. Many kinds infest wood that is dead and decaying. Comparatively few work in living tissues These are the troublesome and injurious ones. The Leopard Moth, *Zeuzera pyrina*, is the most troublesome at the present time. The larvæ of these insects remain within the wood, and beyond the reach of ordinary insecticides. In some instances, they live three years, and excavate channels in the wood that are injurious. They may be cut out in some cases; in others they may be reached by a wire and destroyed. A little bisulphide of carbon injected into the burrow, and the opening closed with a little putty, will prove effectual. The vapor of the bisulphide will penetrate the full length of the tunnel, and will kill the larvæ without injury to the tree. These methods are slow, and require an expert to practice them successfully. It is claimed that a German compound, Raupenleim, insect lime, and a somewhat similar compound called Dendrolene, invented by Prof. E. L. Nason, of New Brunswick, N. J., may be used to prevent the attack of borers, and also to prevent the larvæ in the wood from issuing a perfect insect when the time of transition arrives. It is a sticky substance and may be spread upon a surface and retain its sticky and soft condition a long time. It is claimed that no insect can walk on this substance, and no eggs can be deposited in the bark of the tree through this coating, neither can the perfect insect penetrate it to get out from its burrow. Where the attack of the borers is limited to a comparatively small area, as, for example, the peach tree borer, or that one that destroys the lilac bush, it appears that these substances can be applied with advantage. They are certainly worthy of careful study."

THE DWARF HORSE CHESTNUT.—Respecting the Dwarf Horse Chestnut, of North Carolina, *Æsculus parviflora*, and a fine specimen in Buffalo, New York, Mrs. S. D. Munro, says:

"Your note on the shrub horse chestnut interests me, because for years I have admired such a one in a front yard here. It is about six or seven feet high, and spreads over a large space, with numerous stems apparently springing directly from the ground. The flowers are white. It is an old place, and has other fine plants, among which is a large gingko tree. This was the first, I am told, in Buffalo. I have often regretted that I do not know the inmates of the dwelling. Thought you might be interested in this specimen."

A HUGE COLLECTION OF APPLES.—Possibly the largest experimental orchard of apples in the world is owned by Benjamin Buckman, of Farmingdale, Illinois. His collection embraces over five hundred and fifty named varieties. It seems almost impossible that in any one fruit there could be so much difference that each variety could be surely identified, which it seems is really the case. Those who give their time and money to enterprises like this are public benefactors, and should have more popular appreciation than they generally receive. Fifty are possibly all of general value.

A SUBLIME STORY SPOILED.—Some one has asserted that there is but a narrow line between the sublime and the ridiculous. How true this may be is illustrated by the following from a Chicago correspondent whose levity, in regard to sentimental matters, we have had heretofore to reprove. But he seems to be a hardened offender, on whom correctional forces are thrown away:

A FANCY FROM FONTANELLE.

"'The Rose in the garden slipped her bud,
And she laughed in the pride of her youthful blood,
As she thought of the Gardener standing by—
'He is old—so old! And he soon will die!'

The full Rose waxed in the warm June air,
And she spread, and spread, till her heart lay bare;
And she laughed once more as she heard his tread—
'He is older now. He will soon be dead!'

But the breeze of the morning blew and found
That the leaves of the blown Rose strewed the ground;
And he came at noon, that Gardener old,
And he raked them softly under the mold.

And I wove the thing to a random rhyme,
For the Rose is beauty, the Gardener time.'"

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"And the beauty of all this random rhyme,
Is, there was no one there to take his 'time;'
So the Gardener presented a stuffed pay-roll bill,
And the boss had to swallow a bitter pill."

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RAISING NEW FORMS BY HYBRIDIZING.—It is remarkable that the raising of new varieties by crossing or hybridizing is not more practiced by the lovers of gardening. There are few garden operations that afford more pleasure. The distinction between crossing and hybridizing is that crossing is the term employed for the interbreeding of varieties,—hybridizing refers to the mixing of different species. For instance, if we raise seedlings between a common red flowered horse-shoe geranium and a white one, that would be considered a cross,—but seedlings raised between the horse-shoe geranium and the ivy leaved geranium, would be regarded as a hybrid. Prof. Munson, of the Maine State Agricultural College, has raised hybrids between our common garden tomato and the small cherry tomato which people sometimes raise for ornament. These are said to be as large as a fair sized garden tomato, but bear the tomatoes in long clusters like currants. Referring to the general subject, he remarks:

"Any one can perform the mechanical operation of crossing plants; but the haphazard uniting of individuals is of little value. To breed plants intelligently we must have a distinct type in mind and work toward our ideal. In order to do this we must have some conception of the effects likely to be produced. The most prominent effects of crossing, as would be expected, are seen in the offspring; and it is of the greatest importance that care be used in the selection of parents. If the parents are very different in character the offspring will probably be weak. But the converse is also true: A cross between closely related species or races is more vigorous than its parent. It is well proved that 'crossing is good for the resulting offspring because the differences between the parents carry over new combinations of characters or at least new powers into the crosses. It is a process of revitalization.'

The limits to which cross-breeding is either possible or profitable are not yet well understood. As a rule, closely related species will cross readily; while widely different species cross with difficulty; but this rule has very marked exceptions. It seems impossible to cross any of the varieties of winter squash—*Cucurbita maxima*—such as Hubbard, Sibley, etc., with varieties of summer squash or with the pumpkin—*Cucurbita Pepo*;—while we feel safe in saying the cucumber and the muskmelon cannot be crossed.

In selecting parents, the question naturally arises as to which shall be made the male and which the female parent in order to produce certain probable results. It was formerly held that in case of a hybrid the female parent gives constitution and vigor while the male parent gives form, size, color, etc. But at the present time it is generally conceded that the results will be approximately the same no matter which is used as the male or female parent.

It is not always possible to select our male and female parents at will. In other words, reciprocal crosses are not always possible. For example, I may cross a yellow bush scalloped squash with the summer crook-neck; but I have never yet been able to cross the crook-neck with the bush scalloped. Other cases of a similar nature are not infrequent. Why is this failure? Is it due to a constitutional peculiarity; to the form of the ovarium; to a weakness of the pollen of the one species or variety, or what may be the underlying cause? The question is yet one of the unsolved problems."

JAPAN PRIVET HEDGES.—Adversity has its useful lessons as well as its afflictions. Under the late phenomenal drouth, many plants succumbed. Strange to say, the Japan Privet stood the ordeal unharmed,—and this, too, in situations where it seemed hardly possible anything could live. Along a portion of the grounds of Mr. A. H. Mason, in Germantown, there is a deep cut. The sloping bank, seen in the picture, extends along the top of this cut, and is supported in some places by a wall of eight or ten feet. Along this bank is the dwarf Japan Privet hedge; nothing could be more unpropitious in such a season,—but not a leaf gave out.

HEDGES OF JAPAN PRIVET.
(On the grounds of Mr. A. H. Mason, Germantown, Philadelphia.)

There is no need of a hedge for protection here. It is used, as a frame would be to a picture, to give a finish to the grounds. As seen here, it excites universal admiration.

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SWAMP PLANTS ON DRY GROUND.—It is remarkable that, with very few exceptions, plants which are found naturally in wet or swampy places do much better when transplanted in comparatively dry garden ground. What is known as the Swamp Magnolia is a good illustration of this. Nowhere in its native swamps can any one see as large or healthy plants as are to be seen everywhere in gardens. The explanation is that the plants are in obedience to the law of nature that everything should be made use of. The swamps have to be made use of by nature as well as dry land, and it has been so ordered that the seeds of certain plants shall only sprout in comparatively moist places. The trees have, of course, to continue their existence where the seeds sprout. Nearly all the swamp plants that are found to grow so well in dry ground will not have their seed grow under such circumstances. The seeds themselves have to be planted in situations similar to that in which the plants grow naturally. Swamp maple, swamp magnolias, and the native holly are examples of plants found in swampy places, that flourish in dryer ground.

RUDYARD KIPLING'S WINDOW GARDENING.—A Brattleboro, Vt., correspondent says:

"Rudyard Kipling, the novelist, has built him a cottage under the brow of a high hill in Vermont. In it is a window overlooking a vast stretch of country across that State and the neighboring State of New Hampshire. A distant view, with little or no foreground, the country sloping rapidly toward the Connecticut river. Out of the woods on this hill, he has taken young White Pines, a foot or so high, and placed in boxes before that window which dominates the above view. It was a revelation to me how nice young evergreens look in winter in pots and will grace a window."

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"Those persons who were employed by the Vestry to carry out the work possessed but a scintilla of the principles on which tree-pruning is based, for the whole of the branches have been most severely cut back, and the trees will long remain in evidence of the incompetence of the workmen or their employer, we do not know which. The proper method of pruning in this case would have been to cut back the longer branches to a well-placed lateral shoot, which should not have been shortened or touched in any way. By doing this to every leading branch, the heads would have been greatly reduced in diameter, whilst their natural contour would not have been spoiled. Moreover, all branches of such a size as to render the use of the pruning-saw a necessity, should be pared over—both the wood and bark—so that the healing-over processes may be carried on without hindrance, and no rough surface left to form a lodgment for water. The cuts, whether of knife or saw, should be so given, that the exposed surface is not directed upwards, but slanting-wise, or facing directly downwards; and the larger surfaces should be painted of a slate-color."

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Forestry, as a branch of agriculture, should be defined as getting the largest possible profit from a given area of land within the shortest time. Forestry, as understood by current literature, is a certain something connected with national interests, wholly aside from questions of individual interests in the way of a profit and loss account. These two lines have been somewhat confused, and there have been little favorable results from the forestry movements. For the first line of study, a practical acquaintance with the various species of forest trees is desirable,—the best methods of securing rapid growth, and, of pruning or planting so as to secure good logs. For the latter branch the work of Minister Marsh, entitled, "Man and Nature," is a leading text book.

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INTENTIONAL SECOND EXPOSURE

cactuses belonging to the genera *Cereus*, *Echinocereus* and *Echinopsis*, it is a night-bloomer. Mr. W. kindly furnishes the following account of the plant's remarkable performances:

"Number of flowers on night-blooming *Cereus triangularis*, two plants: In 1892, 65 flowers; 1893, 100 flowers; 1894, 106 flowers; 1895, 188 flowers. Total 459.

The two plants are each in 7-inch pots, but the roots have gone through bottom of pots, into the soil of the bench on which they stand (the pots set on two bricks placed on the soil), which is covered with a layer of ashes (for standing pots, etc.), into which they root freely. The plants are supported on wires running lengthwise of glass partition at back of greenhouse, covering a space of 7x16 feet. The situation is full sun exposure without a particle of shading. The plants are about ten years old, raised from cuttings, are watered plentifully during the growing season, but kept moderately dry during winter, only getting moisture from the watering of pots standing on the ashes. Temperature, 50 to 55."

GEORGE S. CONOVER CHRYSANTHEMUM.—Some specimens of George S. Conover Chrysanthemum, which a Rochester firm dedicates to the well known enthusiastic horticulturist of this name at Geneva, New York, come to the conductors' table. There are now so many large yellows with admirers, that it would not be a bad idea to have them all together in a tournament some time. It would not be surprising to see the George S. Conover come out ahead.

RECOLLECTIONS OF THE VERBENA.—I was very much pleased on reading the article in your MONTHLY on the verbena. We *old men* do not like to see all the old favorites discarded to make way for new plants, that "in many cases" are not near so interesting as our old time flowers. I well remember the first time I saw the *Verbena melindris*, and thought it the prettiest flower I ever saw. At that time, I was an apprentice with my father, and the verbena was planted in a small, round bed. In the autumn, after we had taken all the cuttings needed, my father told me to cover it with a few leaves and straw. The following winter, being exceptionally mild, it stood the cold, and flowered better the following summer. That is the only time I have known any one of the family to stand the winter. When Robinson brought out his "Defiance" we thought there was no other improvement possible; but to-day, I should value a plant of *old melindris* more than any other. S. HENSHAW.

FLOWERS OF THE SAGO PALM.—Although not a "new or rare plant," the Sago Palm is rare in a flowering condition, though it is probable that it is often in flower unknown to observers. In many cases the plants present a fluffy appearance at the apex, with what appears to be an unusually large number of young leaves, which never seem to go beyond a certain brief stage of development. These are really undeveloped leaves or bracts, though unlike bracts in general, which are at the base of the pedicel or flower branch, these are collected into a head above the flowers. The writer has never met with a male flowering plant. It is not unlikely that in the male these bracts would be reduced to mere scales, with the stamens in their axils. The fruit in the female plant appears as nuts of about the color and size of a chestnut; but, for want of fertilization, are always hollow under cultivation. One which has recently flowered in England, has been illustrated in the London *Journal of Horticulture*, and is reproduced here.

FEMALE FLOWER OF THE SAGO PALM.

COLLECTIONS OF GENERAL PERRINE.—The great collection of orchids and other rare plants, which gave thirty years of pleasure to the late General Perrine, of Trenton, New Jersey, were recently disposed of by auction to other flower lovers.

FRUITS AND VEGETABLES.

PEAR GROWING IN LOUISIANA.—The readers of the MONTHLY will no doubt be interested in the fact that Northwest Louisiana is one of the best regions in the United States for the successful growth of the pear.

Their vigor, longevity, prolificness, are abundantly tested in the hardiness and abundance of the trees in every place where found. They receive no care, live long, and bear prodigiously. It is astonishing how this most valuable fruit flourishes uncared for. The writer makes this assertion with all deliberation. If other localities assert that nothing but the leathery and insipid Le Conte and Kieffer will succeed with them, so be it. But the writer will engage, to satisfy any thorough horticulturist, that Northwest Louisiana is a superb pear country. And, therein, is wrapped up one of the most inviting opportunities in the South, for the cultivation of this most superb and profitable fruit. The following varieties may be relied on, and are alleged by a most competent authority, to be even a greater success than the Kieffer or Le Conte, viz: The Howell, Winter Nelis, Duchesse d'Angouleme, Seckel—but it is worth while to be more specific in a matter so important, and the practical horticulturist will value minuteness.

Doyenne d'Eté stands climate well, but is not profitable. Beurre Giffard fine grafted on trees of bearing size. Seckel does well; and everybody ought to have it. Winter Nelis magnificent, and endures. Duchesse d'Angouleme, a success, either dwarf or standard. Bartlett fruits splendidly, but blights—as everywhere. Buffum tree all right; but fruit not profitable. Lawrence splendid pear, but fruit very tender. Madelaine on dwarf, has stood through everything. Bears regularly, and heavy, (loaded down) but tree (of course) slow. Belle Lucrative bears heavily. Never dies. Sheldon magnificent pear; fruit perfect, but tree very slow. Japan Golden Russet, bears early and enormously. Tree hardy, good cooking pear. Doyenne Boussock, fine in every respect, except tardiness in bearing. Winter Nelis, fine and luxuriant—fruit and tree. Early Harvest, early—as good as Kieffer. Lawson, on Le Conte stock, does well. St. Michael Archangel, most delicious fruit, but tree rather slow; but not as slow as Seckel, and tree quite as hardy. Tyson, magnificent pear; but tree not quite hardy, and very slow. Conkling, on Le Conte, fine in appearance, large, but no flavor. Clapp's Favorite, fine, smooth; thrifty, but tree rather tender. The Duchesse d'Angouleme is so splendid on standard, and bears such prodigious crops sometimes, as to kill itself by overbearing.

M. B. HILLYARD.

Shreveport, La.

THIN-SKINNED ORANGES.—It has often been questioned why orange growers will graft and plant varieties with thick skins when the great public appreciates a thin skinned one more highly. Asking a grower, if not one of the secrets of the orange growing trade, why this was thus, he replied that the thin-skinned kinds were rarely as productive as the thick skinned ones,—that the public would give no more for a box of thin skins than for a box of thick ones,—and as there was consequently more profit in growing orange skins than in growing orange flesh, the skins carried the day.

We have never heard such an explanation before, and this may be only "chaff." Still, the great question remains, why do orange growers graft and plant thick skinned sorts, when the thin skins are preferable?

THE RHUBARB AS A VEGETABLE.—After the rhubarb has served its purpose by giving us its leaf stalks in early spring, it often throws up an immense bunch of flowers. An English writer states that if this head of flowers is cut off, and treated like cauliflower, it is just as good and desirable. One would suppose that there was something of the acid taste of the stalks in this flower head; but this writer says not. Many plants have a great difference between the elements in their flowers or fruit and the leaves. We can, for instance, eat a tomato, and find it both healthful and agreeable; but, if we were to venture to eat a handful of tomato leaves, they would probably be the end of us. Those who are on the look-out for new vegetables might, however, make a trial of the rhubarb flowers. It may be noted that the tomato is very closely related to the tobacco, and equally poisonous with that celebrated plant.

LARGE AND SMALL PEACHES. — Nature loves variation. Individuals of a species are never exactly alike; but there are bounds beyond which individual variation cannot go. When the individual reaches this limit, it hastens to get back again. Seedlings of a comparatively small peach are generally larger fruited than their parents; but after one has reached an unusually large size, seedlings from that are usually smaller. This is the reason that peach stones from seedling trees are usually smaller than peach stones from grafted trees. The customer in the market wants large peaches, and hence the peach orchardist has to graft the large kinds, so as to be sure of what he has. But this is usually at the expense of a very heavy crop. Where abundance is a point, rather than fine fruit for retailings, as in some districts in the South, seedling peaches are preferred to the grafted kinds.

THE GRAND DUKE PLUM.—There are few better plums, among modern introductions, than the old Green Gage, and others that have been equally well known for a generation or two; but occasionally a new introduction holds its own. An English plum, named the Grand Duke, is one of those fortunate survivals. Although raised by Mr. Thomas Rivers, who has not for so many years long passed away from us, it is yet considered one of the best. Mr. S. D. Willard, of New York, who is our leading authority on American plum culture, considers it one of the best late varieties. He says it is a very abundant bearer, has large and beautiful fruit, and comes into bearing about October the 10th. Its only defect is that it is not a vigorous grower. The tree dealer must have vigorous, strong-growing trees, in order to get a purchaser to buy; and a tree that has a slender looking habit of growth finds few purchasers, hence the Grand Duke is not very well known among those who raise plums for market.

THE CURL-LEAF DISEASE IN PEACH TREES.—The readers of MEEHANS' MONTHLY certainly well understand that the larger proportion of the diseases of fruit trees come from the operations of many small species of fungus. One of the worst of these fungus organisms is the one which causes the disease known as the blister, or curl-leaf. It has been dignified by a good botanical name, namely, *Exoascus deformans*. Like most of these troubles, the little fungus plants originate from a seed, or, more strictly, a spore which lodges on the leaf, through the medium of the atmosphere, and there germinates, the result being the well-known moldy appearance which is associated with the curl. It appears on the leaves soon after they push out in spring. Later, towards fall, new leaves appear, on which the fungus does not operate, as its season for work is in early spring; but the loss of its early crop of leaves is a great blow to the vital power of the tree, and the crop of fruit which follows is generally inferior and defective. A peach tree is generally not so large as to be difficult to spray, and the solution known as Bordeaux Mixture, sprayed over it as soon as the earliest intimations of the existence of the trouble is perceived, proves a certain cure. Careful experiments have fully determined this.

SWEET PERSIMMONS. — "To pucker ones lips as by a persimmon," is a proverbial saying. Every one knows how astringent a persimmon is before frost or anything that hastens fermentation has touched it. Sometimes the tree has within itself the power to start fermentation, independently of frost action, and when this is the case the persimmon is edible long before frost arrives. Other fruits are of the same class. The medlar is a famous German fruit, not far removed from the apple,—but it is as astringent as the persimmon until it begins to decay, then it is admirable. Frost is not called in to aid decay in this instance,—it is simply set aside until it begins to decay naturally. It does not seem a nice phrase, however, to say that "a medlar is not good until it is rotten." The French have a more polite term for it. They say that the medlar is fit to eat as soon as it is bletted. We might with propriety adopt this word for the persimmon. It would sound very well to say that the bletted persimmon is good to eat.

THE LOUDON RASPBERRY.—Mr. Charles E. Whitten, of Bridgman, Mich., regards this new red raspberry as one of the best late varieties that have been introduced. He says it ripens about the same time as the Cuthbert, and is larger than that well-known variety, and a remarkably productive bearer.

THE SENATOR APPLE.—A very heavy apple and of remarkable beauty has been received from Stark Bros. Nursery and Orchards Co., Louisiana, Missouri. It is almost impossible to judge of comparative difference from existing kinds, on account of the great number that have been introduced, without a large number of wax or plaster specimens such as have been made for the United States Department of Agriculture. They regard it as distinct in many respects. We have had a cut made from an average specimen, and append the report of Prof. S. B. Heiges, Pomologist to the Department:

SENATOR APPLE.

"Specimens of the Senator Apple have been received at this division from three sources this season, all being similar in color and markings, and slightly variable in form.

The general form of the Senator is roundish oblate, of large size; surface smooth, glossy; color nearly a solid red with prominent russet dots; stem medium in length and thickness; basin regular, large, deep, furrowed; calyx segments short, generally converging; flesh yellowish white, tinged red, medium fine, granular, very tender, juicy; core small, closed; flavor sub-acid, rich; quality good to very good.

Compared with a well-known variety, as the Jonathan, it scarcely equals it in quality. I should judge it would reach its prime about Thanksgiving. From a comparison of all the specimens that we have received, it appears to bruise easily.

The highly pink tinged flesh of some specimens would be objectionable for cooking purposes.

It is a handsome market variety."

This report accords with our own examination, except that [the dots as well represented in our drawing are grey, and not russet,—and there may be some doubt whether the pink tinged flesh would be generally objectionable, though in some cases, the partaker of apple sauce or stew may suppose some extraneous matter had been allowed a place in the dished article.

PEAR CULTURE IN ILLINOIS.—Mr. Benjamin Buckman, of Farmingdale, Illinois, says:

"It is *very* hard to find a variety of pear that will succeed here on account of blight. I have tried a great many kinds, and am not certain yet that pear growing will be profitable here."

A SUBTERRANEAN VEGETABLE GROWTH.—Mr. Timothy Wheeler, Moscow, Vermont, writes:

"I have another curious vegetable growth, just found in the woods by a nephew of mine, E. W. Dillingham, who is always watching for natural curiosities. The vegetable is *all roots*, with *no top* whatever, and there are no signs that it ever had a top, and it was not broken off of anything else.

The thing (I know not what to call it) laid flat on the ground, just under the top-soil, and covered a space more than 2 by 3 feet. The whole plant will not average two inches thick.

There are two round bulbs, as round as balls. One of them is two inches and one half in diameter, and the other is one inch. This small one has roots on one side of it, with nothing on the other side; while the large bulb has roots on two opposite sides, and it has no signs of any top.

The whole thing was under the surface, and it would not have been found, but for the snaking of logs over it.

The two balls are six inches apart, and they both head the same way; they are connected by a root three-fourths of an inch in diameter.

The bark on the bulbs looks like birch wood.

Each bulb has two main roots, though one of them is the *connecting* root."

The senior conductor of the MONTHLY has never helped to dig up an old plant of the "Man of the Earth"—*Ipomœa pandurata*. But from the wonderful "travelers' tales" connected with these roots, this may be a real case. From all accounts the roots really take on strange shapes sometimes.

THE TANGERINE ORANGE.—In the markets a somewhat flattened form of orange is sold under the name of Tangerine. A recent author notes that in many flowers there is a tendency to grow from the centre and produce other flowers. This is often seen in garden roses and others. This tendency exists to a marked degree in the orange, and a small orange inside, or at the apex of a large orange, is not unusual. In the kind called the "navel orange," the secondary orange is only rudimentary,—but it gives the character which suggests the name. In the Tangerine, the secondary is the only orange produced, the primary orange, as we generally know it, being wholly suppressed. In many cases in the Tangerine variety, an attempt at a third may be noticed. Nature makes the different species of plants out of a very few original pieces. Some are suppressed and others enlarged. She makes the lemon—a different species of *Citrus*—by an attempt at elongation. The thickened point of the lemon, and which gives it a special character, is in all probability the rudiment of a second lemon, produced at the apex of the primary or general one. It would not be surprising to find monstrosities on the lemon trees, where the secondary has assumed something more of a lemon-fruit character.

CASSABANANA.—Under the name of Cassabanana, Southern papers speak highly of a new vegetable of the cucumber or gourd family. It is a rapid climber, and "the fruits are the shape and size of bologna sausages, twelve to eighteen inches long, and three to four inches in diameter, and of a bright scarlet color when fully ripe, and have a strong fragrance of the pineapple—indeed, so strong is its aroma that it will scent a whole building with its delightful odor. It requires a long season to perfect and produce an abundant crop, ripening here from August to away after frost. In the North the seeds should be started in pots early in the spring, and set out in open ground when danger of severe cold is over. The keeping quality of the fruit is something remarkable. They kept sound until January following, and we made some nice preserves with them."

EARLY APPLES.—It is sometimes said that early apples are not much cared for, because so many other fruits come in about, or soon after, midsummer, that the apple is quite at a discount. But a friend, who has a great variety of fruits in his garden, claims that he would badly miss his Red Astrachan Apple tree, which is in use from the middle of July to the middle of August. He remarks that few kinds are good to eat and good to cook at the same time.

WINTER BARTLETT PEAR.—Under the name of Winter Bartlett, the fruit growers of Oregon have a variety of pear which is said to be in every way the peer of the original Bartlett, and it is being extensively planted. It is probably a sprout, and not a seedling.

BIOGRAPHY AND LITERATURE.

WINTER THE NURSERY FOR SPRING FLOWERS.

Death wished to borrow something of thy grace;
And now that thou art lying 'neath the snow,
The grave that holds thee seems a favored place,
Where one might willing go.
But life is not so rich in things divine,
That it would part with such a soul as thine!

A voice of comfort breathes from sorrowing Earth;
If winter is the nursery of flowers,
If purity and loveliness have worth
Beyond this world of ours,
If there is pity for the tears we shed,
If any truly live—thou art not dead!

—FLORENCE EARLE COATES.

In Memoriam on the death of Helen Bell.

JOHN BARTRAM'S WOOD-SHED.—The house in which America's great botanist, John Bartram, spent his life, and which he built with his own hands, has become familiar through the work of the pictorial artists. Why not give the wood-shed which he also built,—for before the discovery of coal, a wood-shed was as important a part of a dwelling house as the dining-room or bed chamber. It was for a long time his potting and packing shed, and doubtless most of the cherished plants of Collinson and other English worthies saw the light of America for the last time here. Professor Trelease seems to have thought it worth taking, as he has kindly given us the photograph from which the cut, see page 11, has been made. It was in this shed the notes for the work published in 1853, describing all the trees then growing in Bartram's garden, were made. The writer of that work lived a mile from the garden. To save his time, the offer to fit up a room in this wood-shed was made and accepted. It is interesting to note on how slight occurrences the course of human events seem to turn. While engaged on that work the author was stricken with typhoid fever. As it was considered improbable that he would live till morning, a verbal will was made in the evening, the chief legacy being his copy of Lindley's "Vegetable Kingdom" to a fellow botanist, who has himself long since passed away. But again the Hand-book of Ornamental Trees, or the trees of Bartram's garden, was in danger. In the successful effort to save human beings from drowning in a wreck, a nail was driven through the left hand, and lock-jaw finally threatened but was defeated, and the author lived to do this much honor to Bartram's name and Bartram's work. It seems odd that some forty-four years after these events Professor Trelease should be able to have the author's outline in a picture of John Bartram's wood-shed.

GEORGE BARCLAY.—In the November number of your journal, under *Coreopsis grandiflora*, I quote: "Of Barclay, whose name is connected with the plant, little more is known than of the early history of the plant itself." I find in "A Biographical Index of British and Irish Botanists," p. 11, the following accounts:

"BARCLAY, GEORGE (fl. 1835-41): b. Huntley, Aberdeenshire; d. Buenos Ayres. Kew gardener and collector. H. M. S. 'Sulphur,' 1835, to Chili, Peru, Panama, Sandwich Isles, Nootka, etc. Plants and MS. Journal in Herb. Mus. Brit. Gard. Chron., 1882, i. 305.

BARCLAY, ROBERT (1757-1830): b. 1757; d. 22 Oct, 1830. F. L. S., 1788. Of Clapham and Buryhill, Surrey. Had large garden. Hook. Exot. Fl. 166. Originated 'Bot. Mag.' (see dedication to vol. liv.) Pritz. 14; Bot. Misc. ii. 122. Portr. at Kew. *Barclaya* Wall."

As the two Barclays seem to have been somewhat mixed up, I thought the above data might be of interest to you. It will be seen that Robert Barclay died several years previous to the voyage of the "Sulphur," consequently the original plant referred to could not have been collected by that expedition.

LORENZO G. YATES, F. L. S.

Santa Barbara, California.

MISSOURI BOTANICAL GARDEN—SIXTH ANNUAL REPORT.—In addition to the usual series of matter useful alike to the botanist and the gardener, this is especially valuable by a monograph of the interesting genus of aquatics,—the *Sagittaria*.

THE RUSSIAN THISTLE IN CALIFORNIA.—Mr. Charles H. Shinn has issued a paper, in Bulletin Number 107 of the Agricultural Experiment Station, of Berkeley, California, showing that this great pest of the agriculturist is getting a hold in that state. As there are already weed laws in California, it will be well to note how far these are practiced in suppressing the advancement of noxious weeds. Mr. Shinn says that so early as 1872 the legislature passed an act imposing a fine of one hundred dollars for allowing the Canadian Thistle to mature its seeds, and that in 1891 and '93 the supervisors of roads had plenary power to provide for the destruction of noxious weeds and insects injurious to fruit trees In 1893, another act was passed, which provides for the eradication of weeds by city councils or trustees of any municipal body, which provides that all weeds liable to be spread may be regarded as a public nuisance, and that the proper officials may clear ground of such weeds and charge the expense against the owner. Mr. Shinn says that there is law enough in California to provide for the eradication, at the early stage, of the Russian Thistle.

THE FLORA OF MOUNT DESERT ISLAND.—The "Flora of Mount Desert Island" was issued last year, by Messrs. Rand and Redfield, the latter of whom has since died. Mr. Rand naturally feels reluctant to have it believed that the positions of the authors' names were by any act of his own. It was only by Mr. Redfield's insistence and persistence, that it was not published as the work of Redfield and Rand, instead of Rand and Redfield.

Some comment has been made on a point referred to in the Memoirs of Mr. Redfield recently issued by the Academy of Natural Sciences, of Philadelphia. In that Mr. Redfield's views on the Nomenclature question are presented from the impracticability of enforcing the priority rule, after names have once been generally accepted. His friends think that his well known objection to the principles underlying the proposed change should have been presented as well as his objection on the ground of impracticability.

GRAY'S SYNOPTICAL FLORA OF SOUTH AMERICA.—Many years ago Dr. Torrey and Dr. Asa Gray started to write a Flora of North America, but before the second volume appeared, the explorations of new territory brought to light so many new species that the book had to be held back in order to describe the many newly discovered plants. Not till the later years of Dr. Gray's life did the gathered material seem to warrant a resumption of the great task. His strong desire was that he might live to finish the task, but death overtook him before it was accomplished. But Sereno Watson and Dr. B. L. Robinson stepped into the vacant chair in the herbarium of Harvard, and though the former has also departed, the work begun by the beloved Gray is still going on. Fascicle 1, of vol. I, part 1, has appeared. It completes the Polypetalous orders from *Ranunculaceæ* to *Frankeniaceæ*. It is a welcome New Year's present to American botanists.

DR. F. P. PORCHER.—Another able and eminent botanist, Dr. Francis Peyre Porcher, passed away in Charleston, South Carolina, on the 20th of November, in his seventieth year. He was medical Director of the armies of the Confederacy during the Civil War, and the straits to which the Southern army was reduced led to a good use of Dr. Porcher's botanical and medical knowledge. The practical information he himself gained was all embodied in a work subsequently published, entitled, "Resources of the Southern Fields and Forests," which ranks probably among the most valuable contributions to American medical and economic botany issued in our country. He was born in St. John's, Berkeley, on December 14, 1825, and was mainly educated in Charleston,—though his education was completed in France.

CALVERT VAUX.—After having disappeared from the home of his son for several days, the body of Calvert Vaux, the famous landscape gardener, was found in New York Bay, November 19th. He had been suffering mentally for some time. Landscape gardening in America took a great stride forward under the lead of Downing and Vaux, and possibly New York to day would have been without its celebrated Central Park but for these two distinguished men. As Olmsted and Vaux, he was little less celebrated. He was born in London, England, December 20, 1824, and came to America in 1848, so that he had nearly completed his 71st year.

IRRIGATION FARMING.—A handbook for the practical application of water in the production of crops, by Lute Wilcox, New York, published by Orange Judd Company.

When Colorado and Utah were first opened up to settlement, few matters amazed the writer of this paragraph more than the enormous crops produced under irrigation. But the secret soon became an open one. Dry earth has the power of absorbing ammonia from the atmosphere. Here was dry desert land, which, for years, had been absorbing ammonia, until it became a perfect bed of nitrogenous manure. Nothing but a little water was needed to set it going. Under rain-fall cultivation, the agriculturist gets too much or too little rain,—but the intelligent irrigationists can apply water or withhold it at just the acceptable time. This little book enters fully into irrigation matters.

APGAR'S TREES OF THE NORTHERN UNITED STATES.—Under this title, a book has been published by the American Book Company, of New York, prepared by Professor Austin C. Apgar, of the New Jersey State Normal School, for the use of schools and private students. Its main object is to describe and determine trees by their leaves and branches when out of flower. It will be found a very useful aid in this direction. It is not confined to trees of the United States, but includes many exotics in cultivation. No one can determine positively the name of a tree by a leaf and branch alone; but in some cases they may, and in all cases the book will aid. It possesses the great value of furnishing useful and instructive object lessons to classes, where ordinary botanical works would be useless.

PRANG'S CALENDARS AND GREETING SOUVENIRS.—Housekeepers, as well as office workers, require calendars,—but few are issued satisfactory to the dwellers in tasteful homes. Prang has met the requirement by issuing beautiful productions which will be welcome to housekeepers. Combining the useful with the beautiful they will ornament any drawing-room table, where they will be for reference. The violet calendar is embellished with violets arrayed in varied forms. The "Happy Childhood" calendar is truly poetical, as well as artistic. The little girl begins her spring life by chasing butterflies. As she grows, even the beloved "dolly" is put behind when the roses blow,—and she closes her year of life by armful's of substantial fruit. The poet's calendar has striking portraits of America's worshippers of nature—Whittier, Longfellow, Bryant and Emerson. Among the souvenirs are a "Posy of Sweet Peas," "Pansies," "Roses," etc. Presumably they can be found in leading book and stationery stores. For New Year's presents, Easter reminders, or souvenirs at all times or any special time, there can be few more acceptable ones.

PROF. J. G. LEMMON.—A correspondent writes that this estimable gentleman and his wife, to both of whom the world is so largely indebted for a knowledge of California botany especially, as well as the botany of other sections, have removed from Oakland to North Temescal, California. He adds "it will well repay Eastern visitors to visit the Lemmons' Herbarium."

GEO. SUCH.—By a note in *Gardening*, we learn of the death of one of the greatest lovers of flowers, Mr. Geo. Such, of South Amboy, New Jersey. No date is given, but it seems to have been in the early part of November. Few amateurs did so much to encourage a love for rare flowers, and his name ought to have a warm place in the history of American gardening.

WINDOW AND PARLOR GARDENING BY N. JONSSON-ROSE, published by Charles Scribners' Sons, New York.

Books on window and house gardening have been numerous. This new candidate for popular favor is remarkably plain in its directions, and especially instructive. It is really the best effort of the kind that has come to our attention.

AMERICAN GARDENS AND GARDENING.—A new work, under the title of American Gardens and Gardening, has been projected by Lucius D. Davis, of Newport, R. I. The illustrations will be an especial feature, and the beautiful gardens about Newport will be among the first described. It is intended to be issued in monthly series, with the view of ultimately binding as a whole.

GENERAL NOTES.

THE NEW VOLUME OF MEEHANS' MONTHLY.—To furnish botanically accurate and artistically drawn illustrations of the flowers and ferns of the United States, at a surprisingly low cost, is an idea that originated with the eminent lithographer, Louis Prang, and which was finally decided on during the National Centennial. It is not too much to say that it was received with national pride. Nothing like it at the price was ever attempted in any part of the world. The sudden and unexpected death of the managing partner in the enterprise, Charles Robson, threw the plans into confusion. The publication suddenly rested. No book publisher would take it up "because most of the profit would go to the lithographer,"—lithographers would not take it "because they were not book-publishers." Most lovers of gardening were also lovers of wild flowers. There seemed to be a wide field open for the spread of gardening knowledge for the pleasure that gardening affored, and these facts suggested the combination which resulted in the firm of Thomas Meehan & Sons offering MEEHANS' MONTHLY. It is a pleasure to feel that the effort is so well appreciated that the magazine will continue for all time. The conductors feel that the work is worth more than the subscription price, and that they are undertaking a task of national importance, fully justifying them in hoping that friends will aid all they can in making the work known. Copies that may be soiled, or lost, through being handed to friends for examination, will cheerfully be replaced.

THE GROWTH FORCE OF PLANTS.—Under caption of "How a Birch Seed Defied Her Wish," the New York *World* has the following:—

"There is in an old churchyard on one of the principal avenues of Hanover, Germany, an ancient grave which has met with a somewhat peculiar fate. One hundred and thirteen years ago it was dug to hold all that remained mortal of Henriette Julianne Caroline von Ruling. The tradition of Hanover is that Frau von Ruling was a beautiful woman in her day, and that, fearing, by some chance, her grave might be opened, and her moldering corpse displayed to view, she took the precaution to keep the seal of her tomb unbroken.

At the back of the massive monument, cut deep into the base of the pedestal, are these words: 'This grave, purchased in perpetuity, shall, to the end of time, never be opened.'

By a strange fate, into the earth that was shoveled over her coffin, fell a birch seed. As time passed on, a shoot pushed itself out between the stones of the massive monument, and then came a struggle between the growing wood and the ponderous slabs. A century passed, and the tree won. Bit by bit, it split and burst open the great monument, and upheaved the great base stones, exposing to view the grave that was always to be concealed and kept tightly closed."

This was sent bv a correspondent for comment. It is possible a birch seed might find lodgment in a little mortar crevice, on the outside of the wall and then send its roots through, bursting open the wall by its growth force. This power can be evidenced by anyone who observes the roots of trees growing on rocky places. If there is any basis of fact in the story, it may be found here; otherwise, it would be absurd.

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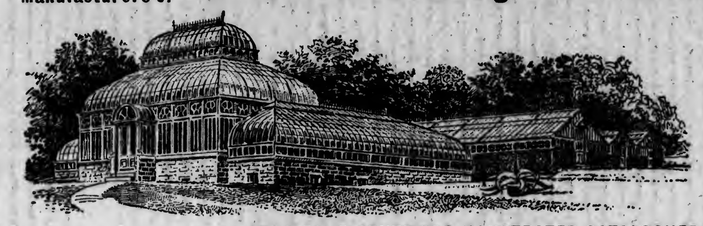

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VOL. VI FEBRUARY, 1896 No. 2

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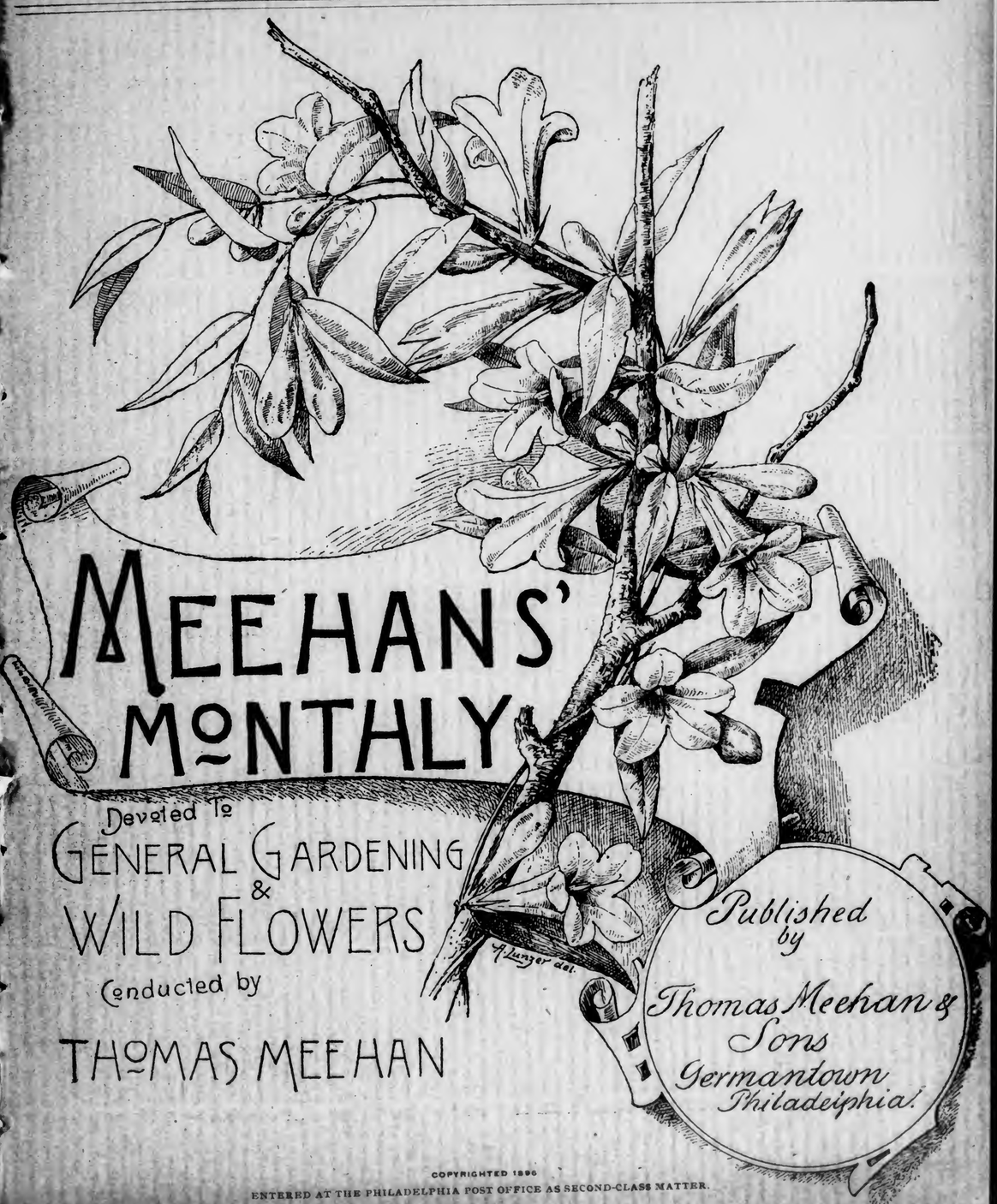

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HEPATICA TRILOBA.

LIVER-LEAF.

NATURAL ORDER, RANUNCULACEÆ.

HEPATICA TRILOBA, CHAIX.—Involucre of three simple leaves, close to the flower, resembling sepals; villous externally. Sepals blue or purplish, rarely white. Leaves all radical, on petioles three to five inches long, sub-reniformcordate, with three ovate-obtuse or rounded lobes. (Darlington's *Flora Cestrica*. See also Gray's *Manual of the Botany of the Northern United States*, Chapman's *Flora of the Southern United States* and Wood's *Class-Book of Botany*.)

The polite history of our pretty spring flower has become somewhat confused. Scholars of the middle ages believed it to be the Leichen of the Greeks, and invested it with the interest which mythology surrounds the fate of that unfortunate damsel. She was the daughter of Æsculapius and Athesis. The former, who was the God of Physicians, educated her to his medical mysteries; but her mother's chief object was to lead her to a life of rigid propriety. When not interested in the study of the medical properties of plants, she was devoted to needle-work for religious purposes, and confined her society strictly to those of her own sex. Suddenly, a youth of good report proposed marriage to her, at which she was much alarmed, never having had male society; but her father insisted on the wedding, at which she became so frightened that she died on the eve of the marriage day. The Gods took compassion on her, as, according to floral mythology, they so often did in similar cases; so they turned her dead body into a flower, which they called Hepatica, chiefly because before her death she had great success in healing diseases of the liver, which the Latinized Greek word Hepatica implies. But, at the historic period we are referring to, those who had claims to plant knowledge discerned two forms of Hepatica or liverwort. Our plant was the great liverwort,—and the green, creeping, membraneous plant found around springs, and known to botanists as *Marchantia polymorpha*, was the lesser liverwort. The name *Hepatica* was retained by modern botanists to represent the great order of these moss-like plants, and also with the name of liverwort. Our plant is also called liverwort in many books; but liver-leaf, also in common use, will be the most distinctive. *Leichen*, *Lychen* or *Lichen* has been given to an order of dry or scale-like plants which grow on rocks and trees, apparently indifferent to whether it ever rains or not. Darwin, in his "Lives of the Plants," seems to have this plant in his mind in connection with this ancient Goddess. He refers to the *Lichen* as growing on barren rocks, slowly preparing the hard face for a better vegetable life, but itself dying ere pretty flowers succeed, and then he sings:

"Retiring Lichen climbs the topmost stone,
And drinks the aerial solitude above.
Bright shine the stars, unnumbered o'er head,
And the cold moon-beam gilds her flinty head:
While round the rifted rock hoarse whirlwinds breathe
And dark with thunder sail the clouds beneath.
The steepy path her plighted swain pursues,
And tracks her light step o'er the imprinted dews;
Delighted Hymen gives his torch to blaze,
Winds round the craggs, and lights the mazy ways;
Shed o'er their secret vows his influence chaste,
And decks with roses, the admired waste."

Leaving, however, the mythological question just as we found it, and without deciding whether the unfortunate Leichen was turned into the solitary loneliness described by Darwin, or the *Hepatica* now before us, we can say that in our times it is welcomed by every one with any poetical feeling as among the brightest ornaments of early spring. European poets make many references to it in this connection, and Americans have also had a share in the pleasant work. Timothy Conrad, better known perhaps as a geologist than as a poet, in his pretty verses on "The Wissahickon in April," says:

"The early Meadow Rue o'ertops the low
Hepatica, that amathystine flower,
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The botanist-poet, W. W. Bailey, has also the early, spring-flowering character in mind in the following lines:

"Thou blossom-blue, with laughing eye,
I cannot tell the reason why
Thou art so dear, except for joy
Thou broughtest to me when a boy.

Ere snows had left the woodland ways
On sunny morns of April days,
I found thee smiling, as in glee,
And peeping through the leaves at me.

The alder-bushes barely show
Their golden tassels o'er the snow;
And pussy-willow's silken cap
Proclaims her yet unbroken nap.

But thou bright flower, brim full of mirth,
Art here to welcome April's birth—
A sign to us that not in vain
Has been the winter's snow and rain"

As regards its botanical history it may be noted that, although it is described as *Hepatica triloba*, there is no essential difference between *Hepatica* and *Anemone*, and most of the leading botanists of our times refer to it as *Anemone Hepatica*. Usually, in *Anemone*, the three stem-leaves form a leafy involucre; but, in this, the involucre has assumed the appearance of the ordinary calyx of other genera. (See Fig. 2). This was made the leading distinction between the two genera. It has been kept distinct here only because as *Hepatica* it has entered so deeply into popular literature. Plants were classified, by the old herbalists, according to the resemblance of their leaves; and the three-lobed leaf of the *Hepatica* caused it to rank as a *Trifolium*. With most of the well known plants of that period, this one had its religious associations, and it was popularly known as "Herb Trinity." It was a great favorite for garden culture, for over two hundred years. There were known double blue, double pink and double white varieties, which had been occasionally found in woods, and introduced into garden culture. It is remarkable that while it is usually found with but a single flower on a stalk, Professor Beale has seen cases where two or three flowers have appeared, and then resembling the Meadow-rue Anemone.

In its geographical relations, it is remarkable that, while it does not exist in England, it is found in Sweden, Lapland and Russia; and, continuing on, enters the United States at Sitka, where it was found by Rothrock, and goes across our continent to Canada and Labrador. On the Pacific Coast, however, it does not go far southwardly. Progressing westwardly, it is found in Minnesota, Iowa and Nebraska; and, as it extends eastwardly, is found in Eastern Missouri, and goes down the Allegheny range to Georgia. In Sweden and Denmark, Linnæus says it grows in dense, dark woods,—while, in Austria and more southern countries, it is spoken of as the associate of junipers. In our country, it is usually found in rocky woods formed of oak, chestnut or hickory. In low, flat lands near the coast, it is not often found. It is not in the catalogue of Suffolk Co., Long Island, made by Mr. E. S. Miller. It grows in immense quantities in the mountains of North Carolina and Tennessee, where it is collected and dried, and sold by the ton for medical purposes. It enters largely into what are known as patent medicines; but has little repute among the regular medical professions. The regular practitioners believe that its virtues do not extend beyond its name. In olden times the medical virtues of a plant were supposed to be indicated by its form, and these leaves, looking something like liver, were therefore applied to liver diseases. It does not appear that this was wholly the case with this plant. Linnæus, though entirely familiar with the doctrine of signatures, as believing by these leaf-signs was called, admits the plant into his *Materia Medica*, and gives it credit for utility in liver-diseases. Our Rafinesque also admits it into his *Medical Botany*. Its misfortune seems to have been that it was too highly praised, and this has led to an opposite extreme. Both Griffith and F. Peyre Porcher admit that it has some slight medical virtues.

It varies much in its foliage. Sometimes the lobes are quite sharp, when it has been described as *Hepatica acutiloba*. Sometimes it is found with five lobes instead of three,—but these differences are not now regarded as of specific importance.

As *Hepatica triloba*, it is said to have been first described by Chaix, in Villar's History of the Plants of Dauphiny, but we have not the means at hand of verifying this point in its history.

EXPLANATION OF THE PLATE.—1. A full grown plant taken in April from the Wissahickon near Philadelphia. 2. The calyx-like involucre. 3. The leaves of last year, decaying after flowering. 4. The new leaves of the season. 5. Pollen grain 470 times enlarged.

WILD FLOWERS AND NATURE.

THE HUMMING BIRD.

"There, lovely bee-bird; may'st thou rove
Through spicy vale and citron grove,
And woo and win thy fluttering love
With plume so bright;
There rapid fly, more heard than seen,
'Mid orange-boughs of polished green,
With glowing fruit, and flowers between
Of purest white."

—CHARLOTTE SMITH.

SEED CORN FROM AN INDIAN MOUND.—An Ohio Falls (Indiana) despatch to the *Indianapolis News*, says:

"A curious experiment was made this summer by Charles Graham, a nurseryman of this county, and the result lies upon the desk before your correspondent as he writes. Last year Mr. A. A. Graham, of Mount Vernon, Ind., made a visit to the vicinity of Alton, Ill., and called upon a friend, who had just opened a mound builders' burial mound. Upon the mound grew several large trees, among them an oak four feet in diameter, and thus the age of the mound was established as considerable. In it were found the crumbling remains of bones, and among other utensils a large pot, containing a maize very much like our present common red corn. Of this Mr. Graham secured several grains, and on returning home planted them. They grew, and the result was that he produced a strain of corn which is most likely the ancestor of the corn we now cultivate.

In spite of having been in the grave for certainly not less than four hundred years, it grew very rapidly and produced a large, well-shaped ear upon a fairly tall stalk. The ear is well set, the grains being somewhat smaller than any of the present varieties, except popcorn. In shape the grain resembles dried sweet corn, being rough and wrinkled. In taste it is sweet and agreeable."

It is to be regretted that anything so wonderful as seeds growing after four hundred years, is not better verified. Only three nurserymen are recorded in the Nurserymens' Directory as being in Clark County, Illinois, in which Ohio Falls is situated, none of these bear the name of Graham. Seeds will remain in the ground and preserve their power to germinate for an indefinite number of years. This is certain. But it requires better proof than the preceding paragraph affords. Seeds are often carried into mounds and stored up by ants, squirrels and other creatures.

THE VIRGINIAN DISMAL SWAMP. The following interesting account of this famous locality is from the *Washington Star*:

"There is fine fishing in Lake Drummond, which contains plenty of perch, black bass, two kinds of pickerel, three species of sunfish and other panfish. There is no dry ground in the swamp; and one sinks, at every step, to his knees in mud. The cane which forms brakes all through the South, is abundant. Together with a varied undergrowth, it is tangled with vines that run up into the trees, so that half a mile an hour is a good rate of progress. One must carry a knife to cut the vines, walking being further impeded by the cat brier, whose thorns catch in the clothing and hold on like hooks. The boats used in the Dismal Swamp are all dugouts, made from cypress logs, 12 feet long and very narrow. To shape such a craft properly is a nice piece of work. The novice who steps into one of these boats is apt to go out on the other side, but the native stands up and paddles with security. The water is darker than amber and excellent to drink; it is said to be a sure cure for malaria. There are no malarial diseases in the swamp. The swamp is full of magnolias from the size of bushes to trees 60 feet high. When I was there they were full of flowers. The cypress trees are cut for shingles. The best trees for the purpose are those which fell from 25 to 50 years ago and are now covered with moss. The negroes wade in and cut off the moss and rotten bark. Then they cut up the log into shingles on the spot. The next best tree is one that is newly fallen, and the third quality is the tree that has to be felled." The absence of malaria is remarkable.

POISONING BY ELDERBERRY ROOT.—The readers of MEEHANS' MONTHLY will remember that the conductors of the magazine put themselves in correspondence at once with the authorities of the Institution of Mercy, at Tarrytown, in 1894, to find out certainly what proved so rapidly fatal to a number of children. Dr. Luke Fleming kindly sent a root pointed out to him by one of the lads that recovered as the root they had been eating. It occasioned us great surprise to find that it was our common elder root, a plant not known before to have such virulent properties. Our identification was generally doubted.

We did not know that the matter had been closely investigated by other botanists till reading a paper on the poisonous plants of New York, by Dr. H. H. Rusby. It will certainly interest our readers, and it is gratifying to the conductors, to find their identification of the piece of root so ably corroborated by this independent investigation:

"Our most direct evidence bearing upon the poisonous character of the elder-berry root rests upon a case which occurred in the spring of 1894, at the Institution of Mercy, a Roman Catholic institution for children, at Tarrytown on the Hudson, and which attracted a great deal of attention at the time in the public press. The grounds of this institution were comparatively new, and ditching and fencing were still in progress at the time stated. A workman in digging a drain, uncovered a large number of roots to which the children took a fancy, and which they began eating. Within a very few minutes, and while still engaged in eating, a large number of the boys were seized with convulsions and several of them died. One of them had the remainder of the root, the marks of his teeth upon it, still clutched in his hand after death. The symptoms corresponded in most features to those of the Cicuta poisoning before described, and to that agent the accident was ascribed in the public press. Several months later I visited the institution in company with Mr. Frederick V. Coville, the botanist of the United States Department of Agriculture, and Prof. Edward L. Greene, Professor of Botany in the Catholic University at Washington. At this time, and subsequently through correspondence, a pretty thorough investigation of the case was made. We found that it was not a locality where Cicuta would be apt to grow, and no evidence existed that any had grown there. Three poisonous plants grew upon the spot, viz., the locust, poke-berry and elder. The workman who had dug the drain, the surviving boys and the Sisters in attendance were positive that it was the elder root which had occasioned the poisoning. They did not know the name of the plant, and had accepted the statements of the papers that it was Cicuta; but they positively identified it by its appearance and by the young purple shoots and compound leaves which they had observed carefully while still attached to the pieces of root which had been taken from the hands of the boys poisoned. Their story was so clear, connected and positive that it was difficut to doubt that the elder root was the poisoning agent. Furthermore, the locust would not have produced the symptoms that were observed; and the poke should have at once been distinguished by even a casual observer. Nevertheless, since the root was described as "like a carrot or parsnip," and since the symptoms in some respects resembled those of Poke-root poisoning, the question cannot be regarded as settled beyond a doubt. In the case of so large a number of victims it is even possible that both of the roots were concerned. The attending physician, Dr. Luke Fleming, does not believe that the poisoning was caused by elder. The active constituent of the elder is not known farther than that a report has recently appeared that an Italian chemist has isolated Coniine from the twigs and leaves of the related European species, *Sambucus nigra*. This would, of course, explain the very similar symptoms to those of Cicuta poisoning. The chemistry of the plant is now receiving thorough investigation in the division of pharmacology in the United States Department of Agriculture."

INSECT LIFE UNDER LOW TEMPERATURE.—Mr. George B. King, in *Psyche*, a well-known entomological journal, asserts that insects freeze solid during the winter and thaw out when warm weather comes. This surely has never been demonstrated. If once the power of evolving heat is lost, life goes with it. At least this is a great principle in biology. There are liquids which do not freeze under a low temperature, and these possibly enter into the insect organism.

THREE VARIETIES OF JAPANESE MAPLE.—SEE PAGE 32

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INTENTIONAL SECOND EXPOSURE

INTERDEPENDENCE OF ANIMAL AND VEGETABLE LIFE.—The saying of a moral philosopher, that a little learning is a dangerous thing, is no better illustrated than by much that we read in relation to the purity of drinking water. Immense sums are spent in making water pure that Nature would purify for us for nothing. On land, animals do not need carbonic acid. They expire it from the lungs. They need oxygen. Plants want carbonic acid, and throw off oxygen. In this way, the balance of purity in the atmosphere is maintained.

It is as true of water as of the land. Water plants throw off oxygen, which is what fish and aquatic creatures need,—while the living creatures give carbonic acid to the plants in return. In this way an even balance is retained. But, in addition, the living things must have food, and they devour every particle of vegetation, living or dead, if there are enough of them to demand all the food. But living beings are not confined to those one can see. Water contains myriads which even powerful microscopes can hardly identify. These also must eat to live. If there be no new source of supply they will soon eat out all the invisible particles, and leave nothing but water,—absolutely pure water. Then they die themselves, because there is nothing more to eat. Water on shipboard is a good illustration. No matter how full of organic material it may be, after a week in the cask it is absolutely pure. One may take the drainage of a manure pile and leave it exposed for a few days so that microbes from the atmosphere may enter. Then cork it up and wait. Unless much vegetable matter be taken in with the liquid so as to furnish plenty of food for the microbes, it will soon be fit to drink. Philadelphia had a pleasant experience of this the past season. It derives its drinking water from the Schuylkill River. They have had, lately, additional subsiding reservoirs, and good pumps to fill them. For months there was no rain. The water in the Schuylkill was fairly black. But after a ten days' subsistence in the reservoirs, the microbes ate all there was to feed on, and then died themselves, when the water was drawn for use it was as clear as spring water. No better illustration of the interdependence of animal and vegetable life, and the simplicity of nature's self-balancing and self-purifying methods could be afforded.

GREEN COLOR WITHOUT LIGHT.—The fact that seeds will often sprout and grow inside a fruit has long been known. The great question incident thereto, is how can the young plants become green in total darkness? Some of the contributors to MEEHANS' MONTHLY contend that the darkness is not total, but that sufficient light is received through the outer cases to form the chlorophyl which gives the green color to the young plants. As bearing on this question, a correspondent sends from a Chicago paper an account of a pumpkin, which a Mr. Russell, of Wabash, Ind., found in his cellar on Thanksgiving Day:

"Mrs. Russell brought the golden globe from the cellar, cut it open and was astonished to find that, while the flesh of the vegetable's interior was sound and sweet, the seeds had sprouted and were growing at a lively rate. Some of the leaves thrown out were two inches in length and of a bright green color. The seeds themselves had apparently taken firm hold in the meat of the pumpkin, but how the miniature vine managed to thrive in the dark, airtight cavity is a mystery to all who have seen the phenomenon."

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THE ROOTS OF NELUMBIUM LUTEUM.—Mr. Edward Tatnall, of Wilmington, Delaware, notes:—

"I notice in line eighth from the bottom on the first page, Vol. V, No. 12, you use Adiantum for Aspidium. Regarding the remarks on 'Nelumbo' on page 224, I have this to say 'Honor to whom honor is due.' I have a letter from Dr. Engelmann, as long ago as 1860, in which he says, 'the tubers of *Nelumbium* are the only part of the plant living over winter.' It is not generally known that there is a three to four acre locality of this plant about three miles below Dover in this State. I visited it last summer."

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"This tree is sometimes called the Swamp Hickory. It has a wide range, extending from Maine to the Saint Lawrence Valley, west to Nebraska and south to Texas. It also appears in Florida. The name Swamp Hickory, so far as we are concerned, is rather misleading. It is true that it grows in swamps; but it is also true that it flourishes luxuriantly on land which is wholly dry. The bark of the tree is of a close, compact pattern. It shows nothing of the roughness of the shellbark, and is smoother even than that of the common Hickory Nut. The tree is best distinguished by yellow buds and its small, narrow, pointed leaflets, which are from seven to eleven (more commonly the latter) in number. The fruit, at first sweet, is more or less bitter, or one might say, astringent and bitter. The shell proper is thin and smooth, and the outer husk is also thin, having six narrow ridges, usually clearly marked.

More than most of our trees, it shows a tendency to produce several shoots from the same root. Of course, one might readily understand this if they were a second growth, coming as sprouts from a stump. But in many instances where this occurs there is no reason to think that it is anything else than an original growth.

Taken as a whole, the hickories are a very variable group. It is sometimes hard to say just what a given specimen should be called. The Bitter-nut is, however, in Pennsylvania probably as distinctly marked as any species except the genuine shellbark."

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A YOUNG PIN OAK.—SEE PAGE 20.

INTERDEPENDENCE OF ANIMAL AND VEGETABLE LIFE.—The saying of a moral philosopher, that a little learning is a dangerous thing, is no better illustrated than by much that we read in relation to the purity of drinking water. Immense sums are spent in making water pure that Nature would purify for us for nothing. On land, animals do not need carbonic acid. They expire it from the lungs. They need oxygen. Plants want carbonic acid, and throw off oxygen. In this way, the balance of purity in the atmosphere is maintained.

It is as true of water as of the land. Water plants throw off oxygen, which is what fish and aquatic creatures need,—while the living creatures give carbonic acid to the plants in return. In this way an even balance is retained. But, in addition, the living things must have food, and they devour every particle of vegetation, living or dead, if there are enough of them to demand all the food. But living beings are not confined to those one can see. Water contains myriads which even powerful microscopes can hardly identify. These also must eat to live. If there be no new source of supply they will soon eat out all the invisible particles, and leave nothing but water,—absolutely pure water. Then they die themselves, because there is nothing more to eat. Water on shipboard is a good illustration. No matter how full of organic material it may be, after a week in the cask it is absolutely pure. One may take the drainage of a manure pile and leave it exposed for a few days so that microbes from the atmosphere may enter. Then cork it up and wait. Unless much vegetable matter be taken in with the liquid so as to furnish plenty of food for the microbes, it will soon be fit to drink. Philadelphia had a pleasant experience of this the past season. It derives its drinking water from the Schuylkill River. They have had, lately, additional subsiding reservoirs, and good pumps to fill them. For months there was no rain. The water in the Schuylkill was fairly black. But after a ten days' subsistence in the reservoirs, the microbes ate all there was to feed on, and then died themselves, when the water was drawn for use it was as clear as spring water. No better illustration of the interdependence of animal and vegetable life, and the simplicity of nature's self-balancing and self-purifying methods could be afforded.

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A YOUNG PIN OAK.—SEE PAGE 29.

INTENTIONAL SECOND EXPOSURE

A CHESTNUT HICKORY.—Modern botany teaches that all the varied plants we see have been, or could have been, derived from a few primordial forms. This doctrine is only an extension of what had been taught in the Department of Vegetable Morphology for a century. The latter science tells us that every part of a plant is but a leaf-blade modified. A number of cells unite and make a flattened membrane like unto the green blade of the *Marchantia* that is so common near springs or in damp places,—and that it is the coiling of these membranes, and subsequent union, that forms axis or stem, and subsequently every organ of the plant. In the language of Dr. Lindley, "the luscious peach, which so pleasantly tickles our palates, is neither more nor less than a bundle of transformed peach leaves." The experienced cultivator knows how to make the individual plant produce flower buds or leaf buds at will by a control of the growth force. Life energy, directed in various lines, changes the character of the leaf modifications; and nature herself often does this by virtue of forces in a measure unknown to us. A rose will often send up another rose from its centre, instead of making a seed vessel. Parts that might have been seeds and carpels, are made into more petals and stamens,—and so on through the whole chapter.

A DOUBLE FRUITED HICKORY NUT.

There is no doubt but that a similar law, influencing the direction of energy, induces the evolution of new species, as it does in the evolution of individual characteristics,—and we can see the evidence of this in occasional variations from normal types, just as we can see the individual variations already referred to. The popular eye can easily tell this is a walnut; this a hickory; this an acorn; this a beech nut; this a hazel nut, or this a hornbeam; but the evolutionist can show how these may have been derived from one another just as easily as the florist can show that one rose may grow out of the centre of another rose, or that a stamen can grow out of a petal, as every florist knows is the case. The shell or leaf-like involucre that surrounds a hazel nut, and which botanists term a capsule, is precisely the same in its original nature as the shell which covers the walnut, hickory, chestnut or beech. But if the popular voice were called in to tell what difference there is between a chestnut and hickory, aside from the prickly burr of the chestnut, the story would doubtless be, that the one had but a single nut, while the chestnut had two or three in the one inclosure. Botanists would commend the statement. But to-day is illustrated, with this chapter, a specimen of the shellbark hickory, *Carya alba*, which has two nuts, and which in form is the analogue of the chestnut. We can see from this piece of chance work how nature can easily make a chestnut out of a hickory, or a hickory out of a chestnut, when the life energy is exercised in these several directions.

And yet it is scarcely fair to say, "a chestnut from a hickory or a hickory from a chestnut," for the law of change is decided before the ultimatum is reached. The true formula might be, that it depends on the degree and direction of life-energy whether the original "bundle of leaves" shall take the form of hickory or chestnut. The specimen from which the illustration was taken was found by Mr. H. Clay Borden, one of the Jessup students of the Academy of Natural Sciences of Philadelphia, at Fort Washington, Montgomery County, Pennsylvania.

THE NUTMEG HICKORY.—The laws which regulate the relative hardiness of trees are obscure. It sometimes happens that a whole genus of hardy plants will have a few tender species. This is illustrated by the Nutmeg Hickory, *Carya myristicæformis*. Repeated attempts at the Meehans' Nurseries, at Philadelphia, have shown that it will not endure the winter climate of that locality,—and is the solitary exception in the whole family of hickories of North America.

BAPTISIA TINCTORIA.—A correspondent, referring to the figure and description of this plant which appeared in the May issue of the MONTHLY, remarks that he has never seen the plant show any love for cultivation. He never knew it encroach on cultivated ground,—or ground that had been cultivated.

GENERAL GARDENING.

IN COMPANY WITH THE DAFFODILS.

"I wandered lonely as a cloud,
That floats on high o'er vales and hills,
When all at once I saw a crowd—
A host of yellow daffodils,
Beside the lake, beneath the trees,
Fluttering and dancing in the breeze.

Continuous as the stars that shine
And twinkle in the milky way,
They stretched in never ending line
Along the margin of a bay:
Ten thousand saw I at a glance
Tossing their heads in sprightly dance.

The waves beside them danced, but they
Outdid the sparkling waves in glee:—
A poet could not but be gay
In such a jocund company!
I gazed and gazed but little thought
What wealth the show to me had brought.

For oft, when on my couch I lie
In vacant or in pensive mood,
They flash upon that inward eye
Which is the bliss of solitude,
And then my heart with pleasure fills
And dances with the daffodils."

—WADSWORTH

THE GROWTH OF OAKS.—When the age of trees, from a timber-growing standard, is considered, the seedling state or first few years from the seed may be left out of the account. We give an illustration of a Pin Oak, *Quercus palustris*, on page 27, of about twelve years old, yet nearly all the growth which the picture presents has been made in five years. It is very easy to tell the approximate age of a tree by its branches. In most evergreens, the annual tiers of branches may be clearly traced; and this can be done, though not so clearly, in a deciduous tree. In the oak illustrated, the past season's growth—a long shoot from a vase-like base, is easily traced. The vase-like branches come from the strong buds that were at the apex of last year's growth; and the main stem can be traced backwards to another set of strong branches coming out of the main stem. This cannot be traced in the picture, but the upper long arm on the right is one of these two-year-old branches. Below this, in the picture, is another strong arm, slightly pendulous—a characteristic of the Pin Oak,— representing the point of growth, three years back. One-half of the apparent height is the growth of but three years. Oaks are in themselves objects of great beauty, and the Pin Oak particularly so,—but the ardent lover of Nature may find much profitable study in them wholly aside from the pure æsthetic feature.

A GREENHOUSE COVERING AN ACRE OF GROUND.—Nothing surprised our European brethren in their visit to the great Columbian Exposition more than the enormous greenhouse, which, by the aid of steam heating, American florists were able to successfully operate. Hot water, with its limited range of operations, is still the favorite method of heating in the Old World. But even here steam heating for large commercial establishments is regarded as only in its infancy. The well-known and highly esteemed firm of Henry A. Dreer, of Philadelphia, has just completed, on its grounds at Riverton, New Jersey, a house which covers one whole acre of ground.

A party of some two hundred and fifty florists recently paid a visit to Riverton for the purpose of inspecting the mammoth establishment, which was explained to them by Mr. Eisele, Mr. Dreer's able foreman. It is the intention to devote the new house to palms and ferns, which, it is believed, can be raised here as cheaply as in other countries.

PEPPERMINT.— The preparation of peppermint is especially an American industry. The peppermint is cut when in bloom, like hay, dried, placed in close wooden vats and steamed. The oil cells burst and the oil passes upward with the steam, which is condensed and conducted into a receiver, where the oil rises and is dipped off. It takes about 350 pounds of dry peppermint to produce one pound of oil. An acre of land yields from 6 to 10 pounds of oil, often more—even as high as 50 pounds. New York and Michigan produce the most.

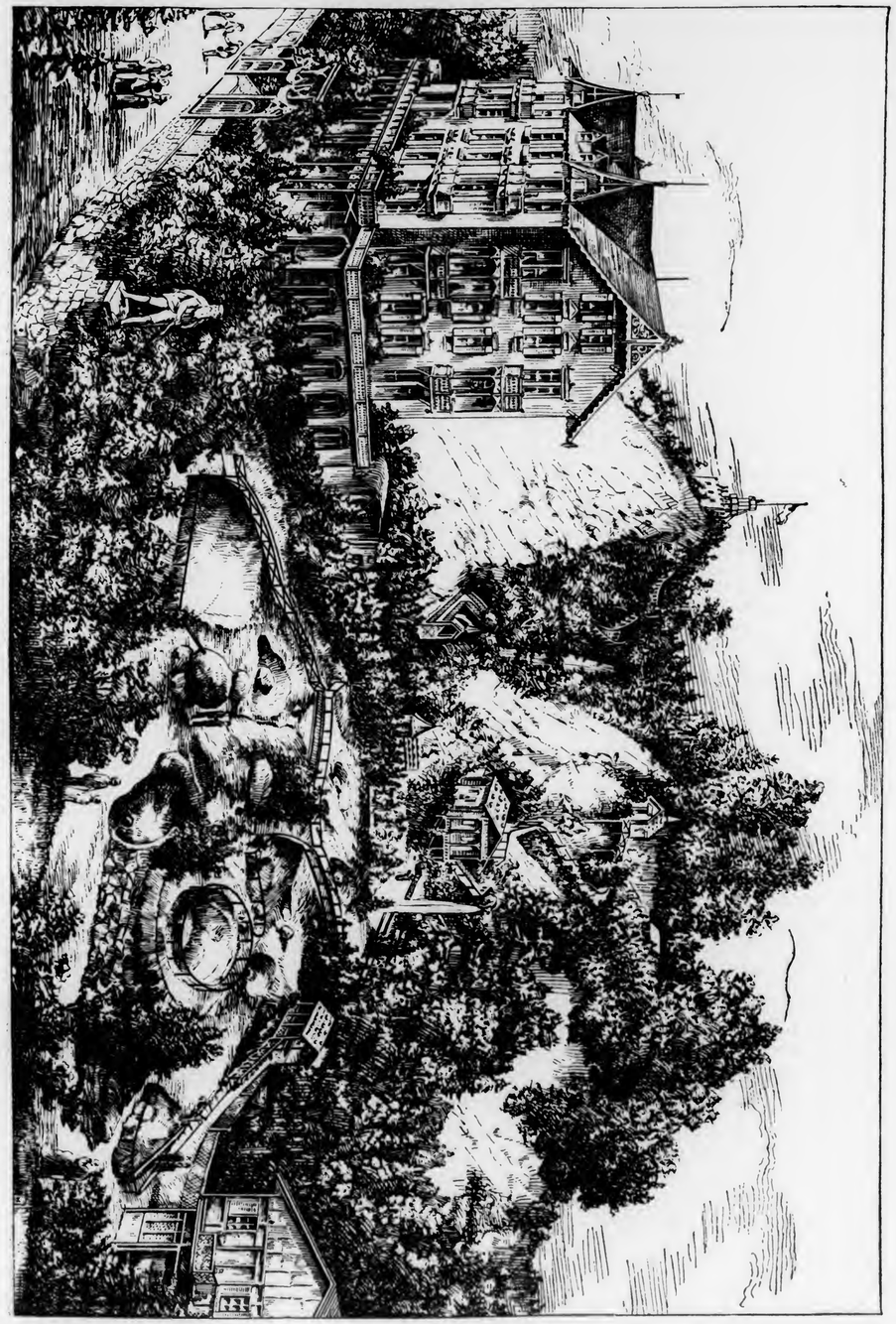
A PLEA FOR WEEDS.—It is hard to find anything in the world that has not a dark as well as a bright side,—and that has not a bright spot, no matter how dark the outline may be. Prof. L. H. Bailey has a good word for the vilest weed. He says the truth is that weeds always have been and still are the closest friends and helpmates of the farmer. It was they which first taught the lesson of tillage of the soil, and it is they which never allow the lesson, now that it has been partly learned, to be forgotten. The one only and sovereign remedy for them is the very tillage which they have introduced. When their mission is finally matured, therefore, they will disappear because there will be no place in which they can grow. It would be a great calamity if they were now to disappear from the earth, for the greater number of farmers still need the discipline which they enforce. Probably not one farmer in ten would till his lands well if it were not for these painstaking school-masters, and many of them would not till at all. Until farmers till for tillage sake, and not to kill the weeds, it is necessary that the weeds shall exist; but when farmers do till for tillage sake, then weeds will disappear with no effort of ours.

TREES ON OLD WALLS.—Travelers often note trees growing on the walls of old ruins,—but it is not common to see them on buildings actually in use. In an early issue of MEEHANS' MONTHLY, reference was made to a mountain ash growing out of a church tower at Utica, N. Y. According to a note in *Forest Leaves*, this tree is now commencing to bear fruit. Its red berries must have a striking effect when seen from below. The correspondent, Mr. E. L. Hall, says:

"The Universalist Church in that city has two towers with battlement finish. On the top of one of them is a mountain ash in vigorous condition, having now a fair crop of berries. It has been growing there twenty or more years, and I should think is fully twelve feet high. Viewing it from the ground I could not conceive it possible that there could be an accumulation of soil nor did it appear that the roots had displaced the stones. It would seem that whatever moisture would be deposited during a rain would be evaporated by an hour of sunshine."

ART AND NATURE IN GARDENING.—The world has always ran to extremes. It always will,—even in gardening. Gardens, a century ago, were elaborate creations. Flower beds in squares,—grounds enclosed by solid walls,—paths straight,—and even the trees sheared into shapes that never existed in the heavens above or the earth beneath. The garden worship of that time did not even reach idolatry. Then came the natural system, under which that garden was regarded the most desirable in which scarcely a trace of the hand of man could be discerned. The mean between these is the beautiful line. As we do not want a house built of coarse, untrimmed blocks, thrown together as if carried down by a glacial stream, so neither do we desire our gardens to be mere trees, grass, weeds and rocks, just as nature strew them.

Abortive specimens of good gardening are as common in the Old World as in the new,—but there are often cases where nature and art walk hand in hand together, charming each other by their delightful company. Such a specimen is given opposite, showing what is known to tourists as the Glacial Garden at Lucerne, in Switzerland. The glacial torrent, in its descent from its mountain home, may make a slight depression in a softer rock. A harder stone finds a lodgment in the depression. The torrent is not sufficient to wash the small stone out of its nest, but it keeps it in motion, and this slow but steady motion in time wears huge basins known as pockets in the hardest rocks. We need not go to the Old World to see these wonderful workings of a small stone. The canons of the Colorado abound with them, and when population settles about the localities as it does in the Old World, we shall not need to go to these countries to profit by these pleasant object lessons. The ancient gardener would not have thought to make such natural beauties elements in his garden art. They would probably have been graded to a level, and marked over with Dutch flower beds. The picture is a good lesson all round. Many of us have some special object of natural interest on our own grounds that could readily be brought in to accord with landscape gardening propriety. The object in garden art should be to develop and show off to best advantage good natural effects, and not to ignore or destroy them.



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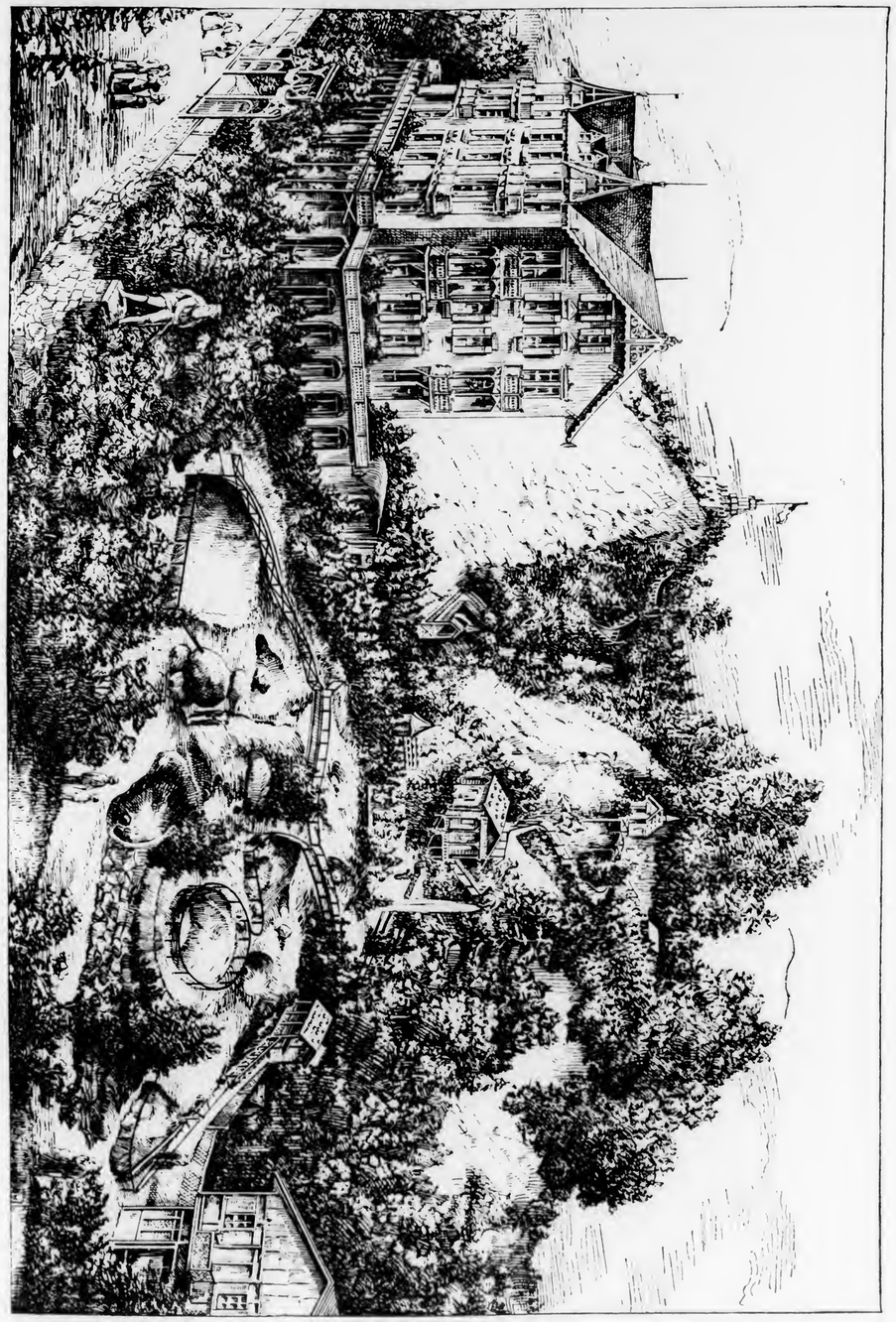

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INTENTIONAL SECOND EXPOSURE

JAPANESE MAPLES.—There are some two dozen species of maple in Japan,—but those which we so much cherish in gardens as Japanese maples are derived mainly from two species, *Acer palmatum* and *Acer polymorphum*. The latest authority on the Flora of Japan, Savatier, considers the last as synonymous with the former, which may do botanically; but among the numerous varieties the two can be distinguished. Savatier also throws in the two older species of Thunberg, *Acer Septenlobum* and *Acer dissectum*, in which he is probably right. He says it is by the industry of the Japanese gardeners that we have such an infinity of form in this species. The names are very much confused in gardens. The three beautiful forms figured on page 25, are supposed to belong to the *polymorphum* group,—the upper the *dissectum*, the central *reticulatum* and the lower *pinnatifolium atropurpureum*.

INSECT EGGS ON STREET TREES.—Mr. Lewis Collins, Secretary of the Tree Planting and Fountain Society of Brooklyn, furnishes the following useful instructions:

"The eggs of the Tussock Moth (*Orgyia leucostigma*) should be hunted and destroyed. They are deposited on trees, may be on any part of a tree, in and around tree boxes and guards, on fences, on buildings and their appendages, and generally in any partially concealed place. These egg masses should be removed and destroyed before spring. Spraying the foliage with insecticides after the eggs hatch in the spring will destroy the caterpillars. Therefore, when one is prepared to spray his trees with insecticides when the proper time comes he need not be so particular to destroy the eggs. But when he is not prepared to spray, the removal of the eggs becomes necessary to prevent a recurrence of this pest next summer. Mutual protection requires that everyone should attend to his own premises. Yards and gardens in many instances are breeding places of this and other insects. The Tussock Moth is particularly fond of cherry trees, and when it has consumed the foliage it moves in great numbers to adjoining yards and trees; and so it happens that one person in a neighborhood may perpetuate these pests while all others destroy them. It is not a neighborly act. And surely one cannot at this day plead ignorance, unless he allows himself to be willingly so. An inexpensive spraying apparatus in the ordinary back yard or garden, properly used, will destroy entirely leaf-eaters of all kinds. All the information required to use it can be had for the asking.

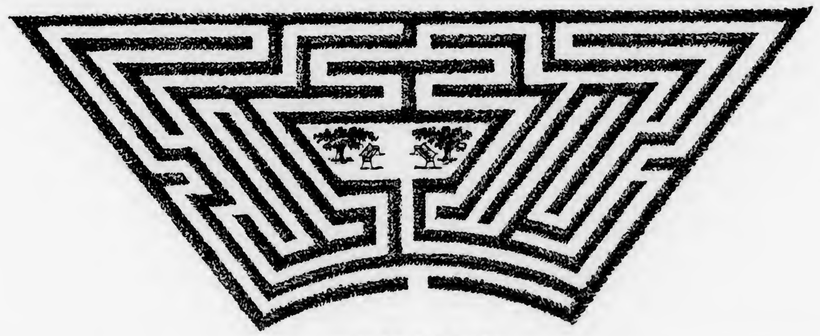
Spraying for leaf-eaters should be done when leaves are on the trees, and the insect first appears. Spraying for leaf-eaters during the winter is useless.

In hunting the egg masses on fences be particular to look under the railings, both top and bottom, and in every obscure corner. Tree boxes and guards, particularly nearly-enclosed wooden ones, are apt to contain many eggs. Rubbish should be gathered and burned, for it is apt to contain eggs and crysalides of various insects."

IMPROVEMENT IN SWEET PEAS.—The sweet pea was a welcome inhabitant of our grandmothers' gardens; but many of these good old dames would hardly believe to-day in the actual loveliness of this charming flower, as developed by modern florists. Even our mothers and their daughters, not to say their sons and sons' sons, who get a bunch of one kind to-day and of another kind to-morrow, know what perfection in endless variety has been reached. Messrs. W. Atlee Burpee & Company, of Philadelphia, have placed on our table a large lithograph showing a great variety of beautiful forms brought together in one picture,—while the picture itself is a model of artistic elegance. The schoolmaster is evidently turning to pictures as one of the best of educational methods.

ACCLIMATIZING EXOTICS.—Southern California being "betwixt and between," as one might say, the temperate and tropical regions, offers good opportunities to test the value of exotic plants for American cultivators. Though the word acclimatize does not now mean a gradual inuring of a plant to conditions foreign to its nature, it is always a matter of experiment whether the nature of a plant is suited to new conditions. Acclimatizing is simply experimenting. A very useful nursery with the object of testing plants of this doubtful character has been established at Santa Barbara. The firm's name is "The Southern Acclimatizing Association." It issues priced catalogues of the rare plants they find successful.

GARDEN PUZZLES.—A few years ago, the writer persuaded a principal of a large public school to have a little fern garden in the school yard. Having a more than usual accomodating janitor, the fern garden was made and admired by every one. Some three years after, again visiting that school, nothing remained but a circular line. The fern bed had been removed and bricked over! Knowing the principal's love of nature, there was some curiosity to hear the explanation. "It was a sore disappointment to me" she exclaimed, "but I had to learn that children do not care to sit around like old men and women admiring ferns." The fact is, children are children, and must have childish things,—and nothing is truer than the poet's axiom that men are but children of a larger growth,—at least the great mass of them.



GARDEN PUZZLES.

In spite of our principles of art and beauty, we must not forget the great want of the mass of humanity. A maze is a very childish affair,—and yet in every large public park and pleasure ground, we would have something of the sort for public amusement. With this is a sketch of the one formed over two hundred years ago on the grounds at Hampton Court, in England, which were given by the frightened Cardinal Wolsey to King Henry VIII. This must have been a hundred years before the maze was constructed, which was in the reign of King William III, so that the mazed condition in which he found himself, when he decided to try to conciliate the wretched king, could not have come from this labyrinth of vegetation. It has given pleasure to thousands since. This one is formed of English Yew, which is a cheap article in England; but any close growing plant is as good. Indeed, for America, a deciduous article would be better on account of evergreens being more liable to die out in places.

POISONOUS ROOTS NEAR NEW YORK.—Dr. Henry H. Rusby, the eminent botanist, gives the following list of plants furnishing poisonous roots in the vicinity of New York:

"*Aconite*, *Cimicifuga*, *Actæa*, *Podophyllum*, *Sanguinaria*, *Phytolacca*, *Robinia*, *Cicuta*, *Sambucus*, *Triosteum*, *Ipomœa*, *Solanum tuberosum*, *Apocynum*, *Euphorbia*, *Arisæma*, *Veratrum*, *Trillium*, *Leptandra*, *Iris*, *Convallaria and Roripa Armoracia*."

By the last name, Dr. Rusby would indicate the common Horse-radish, but the couple of dozen species of plants which have been separated from *Nasturtium* under the name of *Roripa* are not considered sufficiently distinct by those who furnish the botanical dictionaries. Horse-radish is generally known as *Nasturtium armoracia*. He gives this further account of the effects of Horse-radish on the human system:

"*Roripa Armoracia* (L.) Hitchcock, the common Horse-radish, likewise loses its irritating properties when heated or dried. These are almost identical with those of mustard, and while it would not generally be regarded as a poisonous article, yet used in excess it may become so through its powerful irritation of the urinary organs, by which it is excreted. Johnson gives a case in which this result was extreme and serious. It may therefore be borne in mind that it should not be consumed in inordinate quantity. This result, should it occur, would be found excruciatingly painful."

NEW OR RARE PLANTS.

ELÆAGNUS SIMONII.—The practice of making new species on account of trifling variations has received a proper check from modern botanists. Descriptions are now made more elastic. At the same time, there is a tendency to the opposite extreme. In the Meehan Nurseries, the pretty, evergreen, late fall or early winter blooming *Elæagnus Simonii*, of Carriere, has been under propagation for some time. Now that it is ready for distribution, word comes that it must be regarded as a synonym of the old *Elæagnus latifolia* of Linnæus. As this is a tropical plant, while the *E. Simonii* from Northern China will endure severe frost, and possibly the severest New England winter, there must be enough difference to warrant the nurseryman in keeping them distinct. It will never do to sell one for the other.

CYMBIDIUM ALOIFOLIUM.—Many orchids are sweet,—but it is doubtful whether any one can excel in sweetness an East Indian species, rather rare in gardens, *Cymbidium aloifolium*. Its cinnamon-colored flowers make no show, but a spike, set in a bottle of water, will diffuse fragrance through a rather large house. And such a fragrance! The odor of the violet, the rose, the carnation and the mignonette, seem to be all comprised in one powerful volume. It is worthy of remark, by-the way, that art has never been able to successfully counterfeit nature in the matter of fragrance. No matter how deftly the perfumer may imitate the fragrance of any flower, the experienced can tell the difference between a mere perfume and the grateful odor of a natural flower. Whoever enters a room in which there is a flower of the *Cymbidium* might have a thought of Paradise, but never of the laboratory of a maker of sweets.

THE HARDY FLOWER GARDEN.

HARDY PRIMROSES FOR FRAME CULTURE.—We have at present, May 10th, a frame of beautiful, hardy primroses in flower, and a more beautiful sight there is not on this place—no, not even in the aristocratic orchid house. No wonder that Beaconsfield loved the primrose; any one loving the beautiful and simple would. Why is it we do not see them more generally cultivated? Their culture is simple and not costly. Anyone can have these dainty little gems of nature for a trifling outlay and a little patient care. The colors range from pure white to deep maroon; some a delicate straw color; others a deep yellow of the color of the golden-orchid dendrobe (*Dendrobium chrysotoxum*); some marginated and oculated,—others a "solid" color, as *cortusoides*, a beautiful, distinct variety with rose-lilac colored flowers. The plants we raised from seeds in the first instance, and were purchased from Barr & Son, London, England. The varieties are "Dean's Highly Colored," and "Ware's Hybrids." Some of them exhibit the character of *Primula acaulis*, and others seem like the polyanthus, showing their hybrid origin. Seeds sown in March will produce blooming plants the following May. As soon as they are done blooming, we plant them out in a shady border, sheltered from the sun's rays; lift, divide, and pot them in October, and winter them in a frame. If desired, they can be planted out in April at the north side of a building for spring bedding.

WM. FITZWILLIAM.

Boronald, Orange, N. J.

CARPET BEDDING.—The style of gardening by which many variegated-leaved plants are arranged so as to represent patterns on carpet is usually much deprecated by those who love the nature in gardening. Certainly the introduction of carpet bedding was a misfortune in this respect, that in many cases it destroyed the taste for individual plants, and many gardeners, which, before the introduction of carpet bedding, had a great variety of various flowers blooming the whole season through, where left with nothing but a few strips of floral carpeting. It is well, therefore, that the style has been in a measure shorn of its popularity in private gardens and grounds, for looking the whole season, from spring to fall, at the same piece of carpet, must certainly become monotonous in time. Old fashioned flowers are again assuming their place in private gardens; but, as before noted, there are certain conditions which favor the application of this style,—and this is particularly true of parks and public grounds. To persons who visit these occasionally, the first impression of a first-class piece of carpet gardening is certainly very pleasing. In nearly all our large cities which have great public parks, carpet bedding is among the pleasantest of popular attractions.

CHRYSANTHEMUM CULTURE.—February or March is a good time to put in cuttings. Select the short shoots from the base of the plant, bare the leaves well, of the cuttings,—insert them into flats of half-leaf-mould and sand,—place the flats on a bench near the glass with no bottom heat, temperature 45 by night. If the sun is too strong during the middle of the day, slight shading will be beneficial. They should be well rooted in four weeks; then they should be potted into three inch pots,—compost one-third loam, one leaf-mould and one sand. When the pots are filled with roots, shift into six-inch pots of two-thirds rotten sod and one third rotten cow manure that has been dried and rubbed down. They should be fit, by the middle of June, to be put into their flowering pots. The vigorous growing kinds need larger pots than the more delicate ones. The soil for this potting should consist of two-thirds rotten sod and one-third rotten cow manure. To each bushel of the compost, add a six-inch pot-full of bonemeal. The soil should be firmly pounded down against the sides of the pots, with a stick, as firm potting insures firm growth. Stake your plant while you have it on the potting bench. After this operation has been gone through with plunge the pots into beds of coal ashes, three [feet? Ed] between the lines. To keep the plants from being destroyed by wind, run a wire on posts along each line, to which tie the stakes. Do not allow the plants to suffer for want of water; but be sure they require it before you give it to them, as careful watering is very important. When the pots are fairly filled with roots, give weak liquid manure once a week until the first of August,—then twice a week until they show color, when it should be stopped. Disbud twice a week, whether for standard or bush plants, throughout the growing season. House them by the early part of October,—ventilate freely,—keep the temperature about 40° by night,—keep mildew in check by dusting the affected parts with sulphur. To kill Brown Fly, dust them with tobacco powder.

ROBERT ANGUS.

Tarrytown, New York.

FRUITS AND VEGETABLES.

CABBAGE IN SEEDLING ROWS.—Last summer was the dryest for many years past in this part of the country, so that cabbage was scarce in these parts. We learn that cabbage sown in drills, two feet apart, without transplanting, and afterwards thinned out, did stand the heat and dryness the best. Of course, the cause of this is very simple,—the main root remained undisturbed and got its food from deeper regions than those that were disturbed in transplanting. The heads of those not moved were as solid as the others. ALB. MILLARD.

PEACHES AND PLUMS IN AMERICA.—That America is a "great country" is no better illustrated than by studying the area over which crops fail. It is rare that we have not some portion that is productive, and hence the failure of a crop is more of a local than a national concern. It is generally understood that the fruit failure was general last year, but the following, gathered by U. S. Pomologist Heiges, shows how many places escaped. It gives at the same time an idea of the heavy capital that must be invested in fruit growing:

"Peaches were almost a total failure in the commercial peach districts of the South, except in Florida and Texas. The immense orchards of Georgia did not yield sufficient fruit for home consumption, while the total yield of the Chesapeake peninsula was estimated at 150,000 baskets, as against a crop of 7,000,000 baskets in 1893. North of Delaware, Maryland and central Ohio, there was a fair crop of this fruit in most of the commercial orchard districts. The Rocky Mountain and Pacific Slope States harvested nearly a full crop.

Plums failed in most parts of the South, owing to the frosts already noted. The Japanese varieties, being early bloomers, suffered the greatest injury. In the North, particularly in New York, the crop was very large and prices extremely low. On the Pacific Slope the yield of prunes was much smaller than in 1893, conservative estimates placing it at 40,000,000 pounds of the cured fruit, of which about 3,500,000 pounds were produced in Oregon, Washington and Idaho, and the remainder in California."

PRUNE CULTURE IN AMERICA. — Drying plums, for the commercial article known as prunes, has been developed to an enormous extent in Oregon and Washington. Mr. E. R. Lake tells the Department of Agriculture that the first commercial prune orchards of this section were planted near Portland, Oregon, and Vancouver, Washington, two cities lying only six miles apart, but on opposite sides of the beautiful Columbia. Vancouver is located in Clarke County, and this is the center of prune culture in Washington. Douglas County is the banner county for prunes in Oregon, though Yamhill is a close second. Wallawalla Valley has a large area of young orchards and will, in the near future, market large quantities of this fruit. While the sections above enumerated are the leading centers of the industry at present, there are several other points at which it is becoming important. In Oregon, Ashland, Grant's Pass, Eugene, Corvallis, Salem, Oregon City and Milton are the local centers of large plantings which will begin bearing next year, as well as of some that are already bearing. In Washington, Olympia, San Juan Island, Yakima and the Snake River Canyon are other points at which young bearing orchards are to be found. At all these points the soil and climatic conditions are peculiarly suited to the growth of the prune.

The varieties of the plum known as the Italian Prune d'Agen and Coe's Golden Drop, are the most popular for the purpose. The trees are set from 18 to 20 feet apart in the plum orchards. Bearing commences the fourth year. In regard to drying the fruit for prunes he says that for that purpose it should be fully ripe. The riper it is without being rotten, the better. With the process of ripening comes the formation of fruit sugar, the especial element desired in this product. As soon as the fruit begins to leave the stem freely and fall to the ground the evaporators are started. Boys are usually employed to pick up the fruit and are paid at the rate of five cents per bushel. None but fully ripened fruit is permitted to be gathered. The boys are not allowed to shake the trees, though a light shake or jar is sometimes given by a person assigned to this particular task. Green or partly ripened fruit makes a very inferior—in fact, a nonmarketable—product, and it is to avoid this loss that great care is exercised in gathering only fully ripened fruit. Some orchardists allow the fruit to lie on the ground several days after it has fallen or been shaken off before gathering it, holding that this mellows and "sugars" the fruit; certain it is this fully ripened or even overripened fruit always gives the best returns in the dried product. Boxes holding from 50 to 60 pounds are used exclusively for the gathering up of the fruit.

Occasionally, though not necessarily, the fruit is dipped in lye to facilitate evaporation.

As practised here, he says "the dipping process is about as follows: A large caldron kettle, holding perhaps 60 gallons, half or two thirds full of water, in which concentrated lye has been dissolved in the proportion of 1 pound of lye to 12 gallons of water, is put over the fire, the water brought to boiling point and kept there while the dipping progresses. A basketful of fruit is immersed in this solution, given a swirl and removed. The object is to bring every part of the prune in contact with the hot lye water. If the work is thoroughly done the skin of the fruit will present, on removal, a blistered appearance, which is accompanied by numerous minute scratches. From the lye water the prunes are taken to tubs of pure, clean water, where the dipping is repeated, even more thoroughly than before, in order to rinse off all traces of lye from the fruit. Even if dipping is not practised, this rinsing is just as necessary for the removal of dirt and other foreign matter that may adhere to the fruit. All fruit is therefore washed before going onto the trays."

As it is only about ten years since the industry was started, its success is wonderful. There are now 40,000 acres,—and nearly $6,000,000 have been invested in it.

VACCINIUM OCCIDENTALE.—The Californian huckleberry, *Vaccinium occidentale*, is said to be much better worth cultivating than the huckleberry of the Eastern United States. It is said to be very productive and to have the berries as large as May Duke cherries.

CASSABANANA.—This new introduction, noticed in a recent issue, is said to belong to the cucumber family. Its botanical name is *Benicasa cerifera*. It has been long cultivated in tropical Africa and Asia.

LEANING OF APPLE TREES.—In many orchards, apple trees contract a habit of leaning. Usually, the departure from the perpendicular is in a given direction. The prevailing impression is that this results from heavy rain storms, the trees being tilted by the wind while the earth is mushy by the rain. But this has not been definitely ascertained by examining the conditions of the trees before and after a storm. Still it is certain the trees show no inclination to lean until they have gained large and heavy heads. Some dispute this, and contend that the tree leans in order to avoid sun in winter. These recommend that trees should be planted with a little lean in the first place. They would plant so that the inclination would be such that the tree would point to the sun at 1 P. M. Others contend that this is not enough but that the leader should point to where the sun is at 2, or even 3 P. M. This means in Michigan or Minnesota. In those latitudes where the sun is not much above the horizon at mid-day during tree planting time, such a rule could not be applied. In the absence of direct tests it would seem that those who look to the act of the storm king in the leaning of apple trees have the best of it.

INSECTS INFESTING THE RED CURRANT.—Fruit growers in the East often envy the fruit growers of the Northwestern Pacific States. Nearly every kind of our garden fruits thrive admirably well, and for a while it seemed as if they required no care from the hand of the gardener or fruit grower. It is, however, only a question of time when the enemy will steal into every garden, even if it were "Eden," and this is getting to be the experience of the Northwestern fruit grower. The ordinary red currant is at home there. In no part of the country are the currant bushes so healthy or the product so large as in Washington State; but the cotton scale has found it out. This is known to entomologists as *Pulvinaria ribis*. It is considered as one of the worst insect pests that the currant grower of that region has to contend with. Kerosene emulsion has to be applied in order to dislodge them.

THE JAPAN PERSIMMONS.—It is said that good, ripe Japan Persimmons make pies that are perfect epicurean delights.

THE PINEAPPLE IN FLORIDA.—Pineapple raising is becoming quite an industry in central south Florida, especially in the lake region, where water protection is afforded. The best results, however, are obtained by growing the plants under a grating cover, which affords protection from occasional frosts and strong winds, and shuts out some of the summer sunshine. The cover is made of narrow boards placed a few inches apart, and is supported on posts at an elevation sufficient to enable the plants to be worked readily under it. The cost of the sheds varies from $300 to $500 an acre.

Orland is the most prominent centre of this interior pine-raising region, and there are several large pineries near this enterprising town. The largest that were in full bearing before the severe weather of last winter killed the tops of all the pine plants in this region are the Modela Park pinery, containing six acres; Russell's pinery, containing nine acres; and Fairview pinery, containing five acres. Quite recently, a tract of forty acres has been purchased just south of the city to be planted in pines, and the work of fencing it, preparing the land for the plants, putting up the cover, etc., is going on vigorously. The plants of the old pineries are rapidly recovering from the effects of the freeze, and it is expected that there will be thousands of fine apples ready to ship during the coming spring months.

THOS. C. BAKER.

Rollins College, Fla.

LARGE CABBAGES.—A correspondent inquires of what use are premiums by horticultural societies for large cabbages, unless it it is in localities where cabbages are grown for Sauer Kraut. He thinks that the perfection of a cabbage for an amateur's garden is one that would not exceed eight or ten inches in diameter. He would have premiums for the encouragement of these.

LOCUST LEAVES FOR SHEEP FEED.—Complaint is sometimes made that the Yellow Locust, *Robinia pseud-acacia*, throws up suckers—but it is said that the young shoots are devoured by sheep and cattle, with as much avidity as they do clover, luzerne, and other members of the same natural family, and so would not be objectionable in a pasture lot.

BIOGRAPHY AND LITERATURE.

COMPENSATION.

The spreading hills with gentle slope
  Lie broadly to the rising sun,
Whose cheering beams of early hope
  Caress them softly, one by one,
While in the hollows, gray and low,
  Thick mists and shadows heavy lie,
For all the morning's ruddy glow
  Has coldly passed the valleys by.

So hill-tops laugh, while valleys weep
  Away the hours of early days,
With sunshine resting on the steep,
  And darkness shrouding lonely ways,
Till evening hastes and shadows sleep
  On every eastward-lying hill.
Then down the slopes the sunbeams creep,
  And raptured vales with gladness thrill.

To lonely lives, which sadly missed
  The early sun's inspiring beams;
To valleys morning shadows kissed,
  But wakened not from laggard dreams—
To these at eve shall come a glow
  Of sunshine o'er the happy plain;
A sweeter joy than mornings know—
  The touch of gladness after pain.

—HELEN EVERTSON SMITH, in *Harper's Bazaar.*

JOHN H. STEVENS.—The *Minnesota Horticulturist* gives a sketch of John H. Stevens, whom it regards as one of the pioneers of horticulture in Minnesota. He was an intimate friend of the well-known Dr. Warden, with whom it was almost impossible to be on terms of intimacy without becoming enthusiastic in favor of botany or horticulture. He was born on the thirteenth of June, 1820, in one of the eastern townships of lower Canada; but his father and mother were natives of Vermont. He was one of the earliest to take up a claim on the original site of the City of Minneapolis, which city has ever since been his home. He has filled many positions of trust and responsibility in public life. He was one of the founders of the Minnesota State Horticultural Society, which was in 1868. He always declined to accept honors in the Society, but was eventually induced to become its vice-president, which office he still holds. His interest in horticulture has been from the first a labor of love.

CEDRUS DEODARA.—A writer in *Lyon Horticole*, an excellent French, horticultural magazine, states that in Nepal, a province of India, this beautiful tree is known to the natives as "Devadara," of which our "*Deodara*" is a corruption. The tree in that country is looked upon with great veneration, from the fact that it has remarkable longevity. It is said that no dead tree has ever been seen anywhere, although this is, of course, a popular prejudice. Still, the fact of the trees, longevity has given it something of a divine character. Among the Hindoostanese, the native word signifies a divine tree,—or more properly, a tree of life. It is remarkable that a very closely related species is the Cedar of Lebanon. It was said of this, in Olden Times, that they never died, and it is undoubtedly the tree of life referred to in Babylonian inscriptions, and possibly of the scriptures also. The writer of this paragraph has identified figures of this tree on Babylonian pottery, evidently used in public worship, and indicating clearly the veneration accorded to it. It is remarkable that the two legends should accord in connection with practically the same tree among people so widely separated, although there are some who think that they ought to look to ancient Indian legend to get at the foundation of much of modern thought.

A. W. BENNETT.—The progress of public parks and gardens in the United States is materially obstructed by the difficulty of getting the right men in the right places. There is an abundance of the right material; but the appointing powers are ignorant of the requirements. Pittsburgh was among the few fortunate ones. With Mr. A. W. Bennett, as superintendent, she was in a fair way to have her parks the envy of other municipalities. Schenley Park was already famous. His sudden death from typhoid fever, on the 17th of January, was a shock to his friends, and a severe blow to intelligent horticulture. He had hardly reached his 31st year.

HISTORY OF THE TOMATO.—Mr. Burnet Landreth, of the well-known seed firm of D. Landreth & Sons, has recently given an interesting account of the history of the tomato in the United States. His grandfather, the founder of the seed firm, was the first, in this country, to grow it for seed commercial purposes, and to-day, the firm is the largest producer of tomato seed in America. It is a native of America, though its exact home has not been clearly ascertained. It was in cultivation by the Mexicans when they first made the acquaintance of the white man. Mr. Landreth thinks that Peru is its original home. It was introduced into Europe in 1596; but as it requires a great deal of heat in summer to bring it to perfection, it never reached more than a rare delicacy in the English cuisine. It first appeared as a kitchen-garden plant, in a Philadelphia seed catalogue, in 1820, and was generally known as the "Love Apple." The first premium offered for tomatoes was by the Pennsylvania Horticultural Society, in 1837. This was followed by the Massachusetts Horticultural Society, in 1839. In 1840, six varieties were catalogued in the lists of vegetable seeds. In France, it was rarely used, except as a garnish or salad, until 1850, or even as late as 1876. Only in a stewed form could tomatoes be had in first-class Paris hotels,—and that with the greatest difficulty. The first great improvement was known as the Figi Island Tomato. This was in 1862. In 1864, Cook's Favorite was the next great improvement to appear; but the most marked advancement was one brought to public attention by Apollos W. Harrison, in 1866. It was called the Tilden, having been raised by Henry Tilden, of Davenport, Iowa. Some fruit was exhibited at the Philadelphia Horticultural Society, one of which was given to Mr. Landreth, and from these seeds the stock, which subsequently got into commerce, was first raised. The packing of tomatoes in tins and glasses was first undertaken in 1848 by Mr. Harrison W. Crosby, of Lafayette College, Pa. They were then fifty cents a can, while the price is now about seven cents.

ROSA RUGOSA HYBRIDS.—The Rugosa Rose seems likely to be the parent of numerous new races. Hybrids have been obtained in France between it and the well known Microphylla Rose.

THE SASSAFRAS TREES.—A recent number of the *American Journal of Pharmacy* has an extremely interesting article on the structure of sassafras, by Dr. Edson S. Bastin, which, while furnishing a great amount of matter interesting to those who deal in drugs, also has much value for the general reader. The name of the tree, as given by Linnæus, and adopted by every authority since that time, is *Laurus Sassafras*. Modern botanists who feel that they ought to go back to original names, notwithstanding the authority of Linnæus, "propose now to call it *Sassafras Sassafras*, a name doubtless applied in strict accordance with the new rules for botanical nomenclature; but whose unpleasant effect upon the ear could not well be endured, except in the hope that sometime between now and the millenium our botanical nomenclature will acquire something like a stable equilibrium." The Dr. comments on the extraordinary feature of this plant, indigenous in the austere climate of Canada, and yet being everywhere at home in the warmest parts of Floida,—and will endure almost every condition necessary to growth in the whole of this vast area. He attributes this wonderful adaptation to a vast variety of conditions to the fact that it is one of the few plants which seems to be a survivor of what is known as the original fossil flora. A large number of supposed species are found in a fossil condition,—that is to say the leaves of the tree are found, and it is supposed they belong to a large number of species, from the fact of their varying in character,—but as our present species of sassafras has a large number of variable forms, even on a small tree, it does not follow that these ancient leaves belong to very different species. However, in the absence of positive evidence of this fact, the palæontologist can do nothing more than name them as distinct species. The journal referred to speaks of it as a tree in the middle and southern latitudes, found with a trunk of a foot or more in diameter, and a height of fifty or sixty feet. In the vicinity of Philadelphia, the writer of this paragraph has seen sassafras trees having trunks of about twelve feet in circumference. They can scarcely all have disappeared, and MEEHANS' MONTHLY would be obliged to any correspondent giving the dimensions and estimated height of any fine specimen that may come under his observation.

GENERAL NOTES.

WARREN H. MANNING.—Mr. Warren H. Manning, son of the well-known and esteemed Jacob H. Manning, of Reading, Mass., and himself one of the most intelligent of the younger race of horticulturists, has announced his entry on the career of a professional landscape gardener. He has had some years practical experience with one of the leading firms of landscape architects in this country.

THE WILD FLOWER PICTURES IN MEEHANS' MONTHLY.—A correspondent, L. Fuller, of Jacksonville, Illinois, remarks:

"For the sake of such a choice collection of prints of our wild flowers as your monthly plates afford, I have seen nothing like them outside of costly works.

I have classes in botany among friends and neighbors, and find them very useful."

INFLAMMABLE GAS IN A HOLLOW TREE.—Going the rounds of the papers is the following paragraph which a correspondent sends to us for an explanation:

"A gas tree was discovered in the southern part of Washington County, Pa., in a very curious way. Hunley Gooch and his son were chopping down an old and hollow tree, when they thought as they struck into the hollow that they smelled the odor of gas. The son struck a match and applied it to the hollow, which the ax had opened. Instantly there was an explosion and the young man had difficulty in escaping without serious injury. The tree continued to burn until its bark was burned off. The ax, which was left in the tree, had its handle burned."

There is always some doubt about newspaper paragraphs giving accurate details when technical topics are reported. It does not, however, seem impossible that in oil regions, in one of which this is said to have occurred, the tap root, or other root deep in the ground, was hollow as well as the trunk, and that this hollow root found itself in an oil vein and acted as a feed pipe to the hollow trunk.

CHINESE THISTLE.—Western editors seem fond of the thistle. The Saltwort, *Salsola Tragus*, became the Russian Thistle. Now they are worrying over another "thistle," which they call Chinese Thistle. A correspondent from Spokane County, Washington, sends a specimen under this name, which proves to be *Lactuca Scariola*, a weed from western Europe. There need be no scare over it, as it is by no means a troublesome weed to contend with. This is probably the farthest western point it has yet reached. It is rather common in the eastern states now.

FOTHERGILLA ALNIFOLIA.—An attempt has been made to change the name of the interesting hardy shrub, *Fothergilla alnifolia*, to *Fothergilla Gardeni*. It is said to have been so named by one Murray, who published an Edition of Linnæus' *Systema Naturæ*, at Gottingen, in 1744. Linnæus himself, and the younger Linnæus who gave the plant the name it has borne for nearly 150 years, wholly ignore Murray's name as have all botanists to the present time. They would hardly do this without good reason. It would seem that those who, by this change, condemn Linnæus, should show us why he was wrong. Willdenow, who, about the time of the younger Linnæus, issued an Edition of Linnæus' *Species Plantarum*, seems to quote from Murray "*Fothergilla Gardeni*—a shrub with leaves and fruit like a *Hamamelis*, but very different flowers. D. Garden." It would appear from this that D. Garden, whoever he was, is responsible, and a name given on hearsay evidence would justify all the botanists from Linnæus to Asa Gray in rejecting it.

Where a name with legitimate description, properly published, has been accidentally overlooked, while a later one has usurped the legitimate place, there seems some good reason for trying to upset a long established name, for all the ill consequences that confessedly arise from the effort. But this is not that.

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GARDENER wants position, German, age 32, married, one child; fully experienced in growing all kinds of cut flowers, greenhouse and foliage plants, vegetables and taking care of large or small private place; had charge of one for last 4 years. Best of references. Address, Gardener, 2222 North 28th St., Philadelphia.

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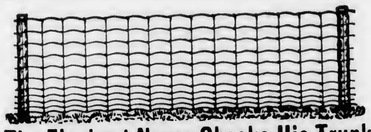

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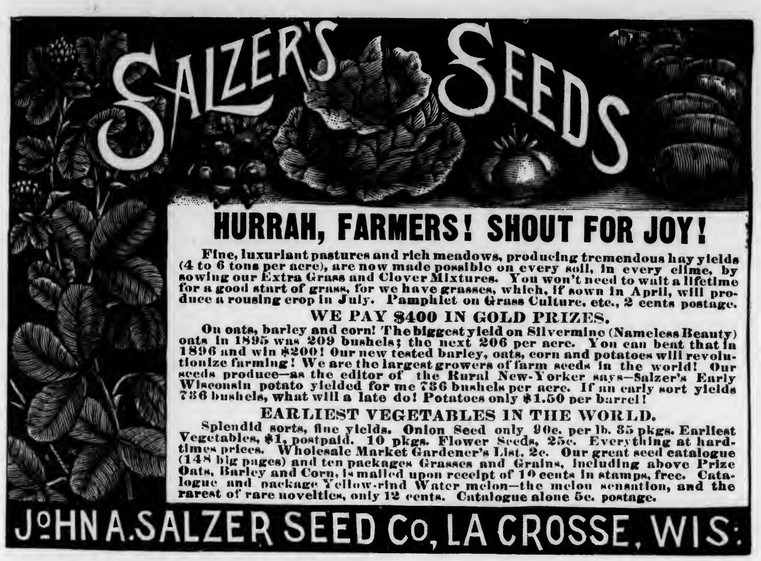

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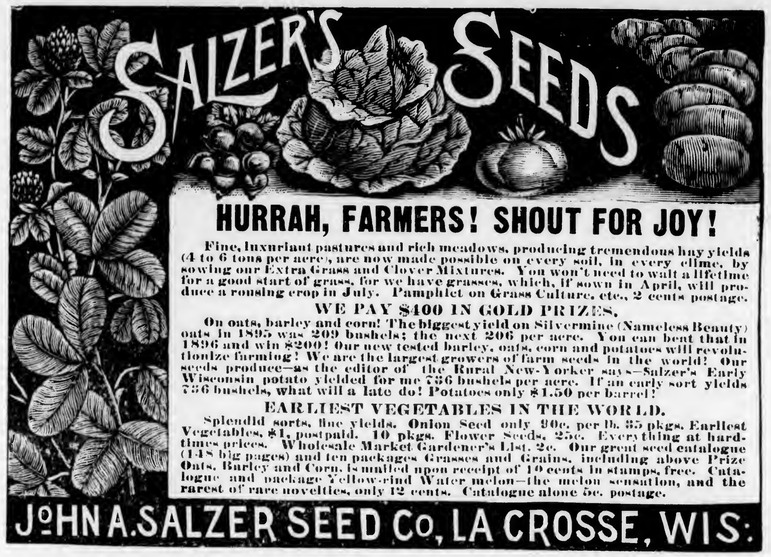

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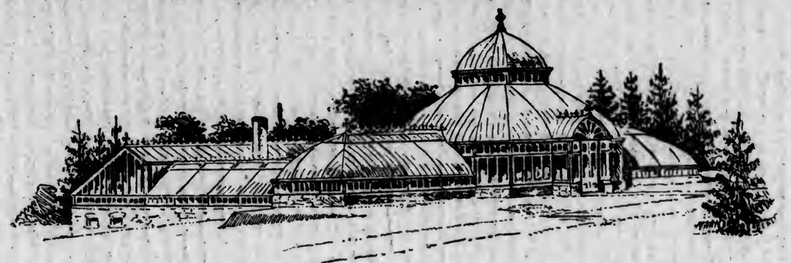

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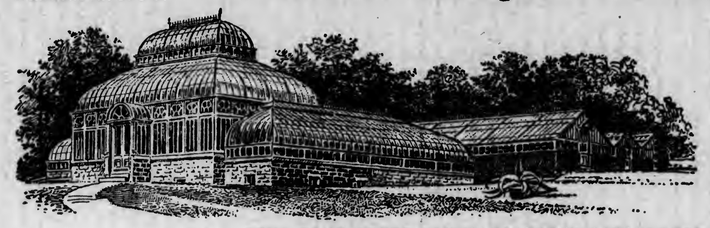

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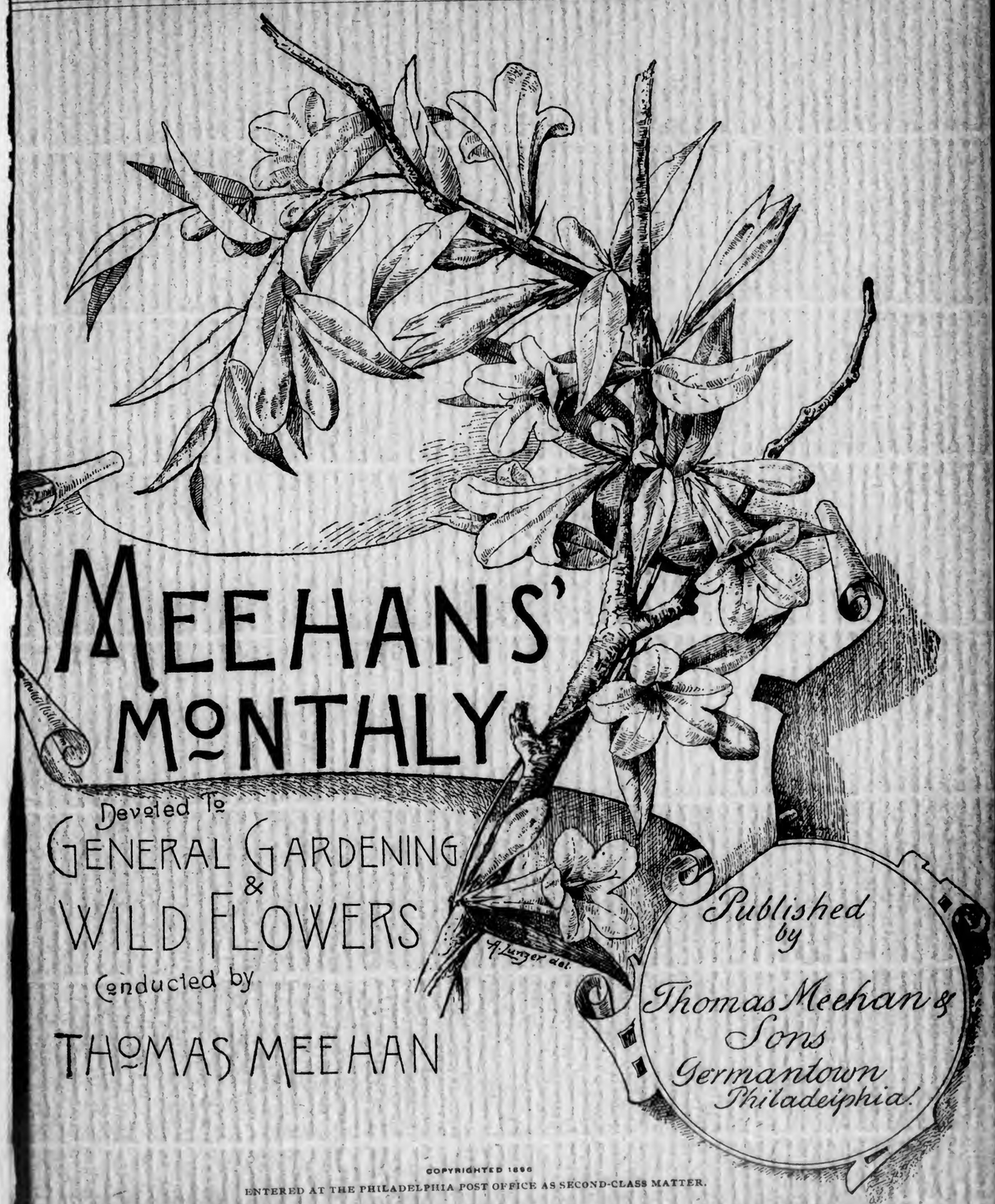

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THOMAS MEEHAN

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DICENTRA CUCULLARIA.

BREECHES FLOWER.

NATURAL ORDER, FUMARIACEÆ.

DICENTRA CUCULLARIA, DE CANDOLLE.—Scape and slender-petioled leaves from a sort of granulate bulb; lobes of the leaves linear; raceme simple, few-flowered; corolla with two divergent spurs longer than the pedicel; crest of the inner petals minute. Gray's *Manual of the Botany of the Northern United States*. See also Chapman's *Flora of the Southern United States*, and Wood's *Class-Book of Botany*.

The natural order *Fumariaceæ*, to which the present subject belongs, is founded on the genus *Fumaria*, some of the representatives of which have been noted from the earliest times. One of them, known in the Old World as the Fumitory, is referred to by the old Roman author, Pliny, and it is recorded of it that it will give off an odor from the ground like smoke; and that, like wood-smoke, it will draw tears from the eyes. From these supposed smoky fumes, the plant has derived its name, *Fumaria*, and Fumitory from *Fumus Terra*, under which name it is indeed described by Otto Brunfels in a medical thesis published in 1532. The name under which it is described by Pliny is *Capnos*, which appears to have been derived by him from the Greeks. Few plants have had so many questions raised as to its proper name as this. Most plants of the order have but a single spur. This has two, and thus has originated the common name of Breeches Flower. The term, *Dicentra*, is expressive of these two spurs. By bad proof-reading, or some similar oversight, the name was rendered *Dieltrya* and *Diclytra*, and there are botanists who hold that what the author meant is of no great consequence in a name, and therefore adhere even to a misprint if it have priority; while others feel free to correct the error, and use the intended name. So in this instance, Dr. Gray, whose description we quote, cites De Candolle as the authority for the name, who described the plant as *Diclytra Cucullaria* in *Prodromus* in 1821,—while other authors give Bernhardi as the authority who used *Dicentra Cucullaria* in the *Linnæa* in 1833. Trouble came in nomenclature also from a difference of opinion as to whether the two spurs form a sufficient generic distinction. Early botanists, long before the time of Linnæus, followed Lobel in using the old classical word *Capnos* for the whole Fumitory family. Then those species with a round pericarp within a large inflated calyx were classed as *Cysticapnos*, and those in which "the nectary of the lower lip is as prominent as that of the upper," were known as *Capnorchis*. Our *Dicentra Cucullaria* was known as *Capnorchis Americana*. While these differences of opinion, as to what should constitute proper generic characters, and consequently what should form a stable name, exist, the same questions are raised, with as much difference of opinion, about the names that should be credited with authorship. Thus Professor Conway McMillan, in his "Seed-bearing Plants of Minnesota Valley", credits Goldie, who gave a list of the plants of Canada in the Edinburgh *Philosophical Journal*, with the name *Capnorchis Americana*,—while other authors credit Boerhave with it, who published an *Index Plantanum*, in 1720. The lesson shows that it is best for the general student to follow the names adopted by the authors of generally accepted works, as in the present case the *Manual* of Dr. Asa Gray is preferred.

The early history of our plant seems to be that it was sent to the Old World in the first instance by the Rev. John Banister, from Virginia, and it became quite well-known to cultivators in the early part of the century. Of our own collectors, Pursh refers to it as a *Corydalis*, and says "this singularly constructed flower grows on the sides of shady hills in rich vegetable mould among the rocks, and is known among the inhabitants as 'Breeches-flower,' or 'yellow-breeches,' and, as I consider that all those species with two spurs or nectaries might form, with propriety, a good genus, I have given it the name of *Perizomanthus*."

DICENTRA CUCULLARIA.

BREECHES FLOWER.

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INTENTIONAL SECOND EXPOSURE

In its relationship, it comes close to *Dicentra Canadensis*, from which it differs in the roots, not creeping, but forming a sort of bulb composed of numerous granules. At least this bulb is usually referred to as a "root" in botanical descriptions, though really a bulb as properly as a lily or onion bulb, for it is composed, as they are, of the thickened bases of the leaves. As seen in the illustration (fig. 2), these granules are at the base of the leaf-stalks which disarticulate and leave the starchy granules to form the bulb, which is surrounded at the base by leafy scales. The roots, properly so called, are fibrous and seem to endure only for one season. The granules are red, only when near the surface. If well covered by earth they blanch.

The structure of the flowers rivals that of orchids in their peculiarity. Botanists differ among themselves in their descriptions of the parts. Some consider the two small, ovate, processes, at the base (fig. 6), the calyx. Others regard these as bracts, and call the parts producing the spur-like nectaries the calyx. In the latter case, the two smaller ones at the apex of the flower would be the petals. The stamens seem to be arranged in two sets of three each; but it is probable that, if their early construction could be ascertained, they would be found, in the whole structure, to be built up on a binary plan.

There is yet much to be ascertained regarding the fertilization of these singular flowers. In the round-fruited forms of Fumitories, the anthers are just above the stigma; and, as the petals never separate, the flowers must be self-fertilized. In this species, however, which belongs to the long-capsuled section, the anthers are beneath the stigma (fig. 4), and it seems difficult to conceive how the fertilization is effected. It may be that most of the flowers fall unfertilized. The writer has never seen a mature seed vessel of this species, nor of its Asiatic relative, common in gardens, *Dicentra spectabilis*.

Cornutus, an early writer on Canadian plants, describes this as having "insipid" bulbous roots. Linnæus describes the *Fumaria bulbosa* of Europe as having roots "Amara," "Acris," etc,—and that of *Fumaria officinalis*, as "Amarissima." Possibly this is insipid merely by comparison. They do not seem to have had their qualities particularly noted in America. Of a related species in Japan, *Corydalis racemosa*, a Japanese author says: "A single leaf is enough to kill a man."

It flowers in Pennsylvania, in April and May, being among the earliest to cheer the wild-flower lover. Its range in the Eastern United States seems to be from high latitudes in Canada to North Carolina, and from there westwardly from Northern Minnesota to Arkansas. It appears again on the Northern Pacific coast, and will probably be found in northern latitudes, across the whole North American continent.

A good lesson in botanical nomenclature may be furnished by an error in the printing of the name on the plate, where it is *Dicentra cucullaria* instead of *Dicentra Cucullaria*. In the reconstruction of the system of botany by Linnæus, he indicated that where he had derived the specific names from proper names, he made use of a capital, otherwise the student would be puzzled to understand the derivation of the term employed. The specific name he adopted in his binomial system would be frequently the proper or generic name it had formerly borne. Hence his *Ranunculus Ficaria* was not so named by him because it had fig-like roots, which might be assumed if he had written it *ficaria*, but because *Ficaria* was the name of the genus to which this species of buttercup was anciently referred. Even in modern times, when plants' names are derived from aboriginal names, places of growth, or other sources that would be termed proper names, the use of the capital in the specific name expressed a full chapter in the history of the plant. Some modern authors have abandoned the use of all capitals in the use of specific names, apparently for the sake of uniformity in the manner of the spelling; but this practice is not adopted by the larger number of botanists. By writing *Dicentra Cucullaria*, the student is at once informed that the name is so constructed to indicate that *Cucullaria* was once its generic name. This explanation will serve in other cases.

EXPLANATION OF THE PLATE.—1. Plant from the Wissahickon Creek, Philadelphia, furnished by Dr. Hedemann. 2. The scaly basis of the leaves. 3. The outer sheathing scales. 4. A flower, divested of petals, showing the six stamens in two sets with the large, capilate stigma above the anthers. 5. Enlarged flower, showing the position of the two (inner) petals. 6. The bracts (or sepals), the figure 6 not being very distinct between the two spurs in the plate.

WILD FLOWERS AND NATURE.

MARCH.

Like some reformer, who with mien austere,
Neglected dress and loud insistent tones,
More rasping than the wrongs which she bemoans,
Walks through the land and wearies all who hear,
While yet we know the need of such reform;
So comes unlovely March, with wind and storm,
To break the spell of winter and set free
The prisoned brooks and crocus beds oppressed.
Severe of face, gaunt-armed, and wildly dressed,
She is not fair nor beautiful to see;
But merry April and sweet smiling May
Come not till March has first prepared the way.

—ELLA WHEELER WILCOX,
in *Ladies' Home Journal*.

THE NEST OF THE CHIMNEY SWALLOW.—I am pleased to notice Dr. Van Denburg's queries in the January MONTHLY, and on re-reading my recent note, I find that, in the attempt to be brief, I was a little too brief, and consequently a little more positive than I intended. What I should have written was this, "one who will observe the bird, and who will examine a nest, will, I doubt not, discover the material which forms the bulk of the structure to be the gum of the cherry and peach trees." I make this correction now, because I desire to record only to the extent of my knowledge and belief.

I have not seen the birds actually collect the gum referred to, but I have watched them closely enough, and long enough to be convinced that the material they use is something wholly extraneous. Whether the Chimney Swallow furnishes the substance which lines its nest, or whether it collects a foreign matter and makes use of it, may not be a matter of vital importance,—nor even a question of general interest,—but for many reasons I am glad the readers of MEEHANS' MONTHLY are prepared to discuss the subject.

I am sensible that the weight of recorded testimony is against the theory advanced by Prof. Meehan and supported by myself. Since the appearance of "The American Ornithology," nearly every one who has written upon the subject has either copied from it verbatim, or else appears to have been overwhelmingly influenced by the conclusions there expressed; and this is quite pardonable, for Wilson was a keen observer, and seems to have given the Chimney Swallow its full share of attention. Wilson has told us that the "twigs" are "fastened together with a strong adhesive glue or gum, which is secreted by two glands, one on each side of the bird's head, and mixes with the saliva." Dr. Brewer goes a little beyond this, and informs us that "when dry, this saliva hardens into a glue-like substance apparently firmer even than the twigs themselves." This practically is what Gentry has recorded in his "Life Histories of Birds," where he tells us "the twigs are fastened to each other by the saliva of the builder. This saliva after a slight exposure hardens into a glue-like material." Thomas Nuttall in his "Ornithology of the United States and Canada," radically differs from the authorities quoted by saying, "a copious quantity of adhesive gum or mucilage secreted by *the stomach of the curious architect*," is the material which unites the work. This then is the recorded testimony. To a pair of Chimney Swallows which had their nest in the stack of a bake-house, and whose movements for several seasons I had the privilege of observing, I will confine my remarks. This bake-house stood upon a farm bordering upon the Perkiomen Valley in southeastern Pennsylvania,—a region noted for its ornithological treasures, and one which will long be remembered in connection with that eminent naturalist, John James Audubon. The chimney of this bake-house was so situated, that from the attic of the dwelling house adjoining, one could conveniently look down it.—and from this point I spent many an hour watching the birds, both in the building of their nest, and in the rearing of their young. Not once, but several times I observed their work; for as the presence of the birds is considered objectionable, the nests were pulled down when the young had disappeared. At the time I am writing of, I unfortunately did not possess an opera glass,

and I could not satisfy myself as to the exact method employed in building and finishing the nest. In the stack the birds were very awkward and clumsy, and appeared to be able to use their feet only to cling, and this they did in a way to hide their method of work from one in an elevated position. This much I know, however, the birds left the stack at frequent intervals for material, and returned with what they had collected, and what they made use of appeared to be dependent upon its collection. The conclusion that the composition of the bulk of the nest is from the gum of the cherry and of peach trees was arrived at by an examination of the nest itself. Upon this point, I never have had any doubt, and if I shall prove in error, I hope to be corrected. I have never dissected the bird, but I have examined it superficially, and have failed to find its mucilaginous reservoirs. Alexander Wilson is responsible for the statement that the bird "is never seen to alight but in hollow trees or chimneys," and generally speaking this is correct,—but I can hardly imagine an observing country boy who has not seen one endeavoring to settle upon a fence. Both Wilson and Nuttall record the Chimney Swallow building in hollow trees; and our own townsman, Prof. Gentry, gives one instance of a nest on a board in a winter log house, and another one against the roof of an out-building; so that the species is not entirely iron-clad in its habits. I hope the discussion of this subject may be continued until the question is determined, when the result I feel sure will be against the authorities,—and in favor of Prof. Meehan.

Philadelphia. EDWIN C. JELLETT.

WILD RICE.—Few know more of the reed of our river mud-flats than that it furnishes the food on which fattens for the epicure the reed-bird of autumn dinner tables—the bobolink of other seasons. But as wild rice—*Zizania aquatica* of science—it has played no mean part in the service of man. It was the staple food of the Indians that formerly inhabited Northern Wisconsin and Minnesota, where the plant abounds on the margin of lakes. Dr. Elliott Coues says that it is still the chief recourse of the Objibway Indians on the reservations of Minnesota. They not only gather it for their own use, but for the purpose of trade. A common name is Indian Rice, and the lakes along which the plants abound are known as rice lakes. Whole Indian villages will be tenantless in autumn, the inhabitants having gone "ricing," as the harvesting is termed. The Indians push their canoes into masses of rice, bend the heads of rice over a crotched stick, and thrash the grain into the bottom of the boat.—*Independent*.

NOTE ON FERNS, LYGODIUM PALMATUM AND ASPLENIUM MARGINALE.—Mrs. F. L. K., Danville, Vt., notes in regard to some recent fern illustrations:

"*Aspidium marginale*, in this region, has bright brown spores. I have gathered it at all stages of growth, and have never found any that approached black, though some have darker shades of brown than others. The day that the October, 1895, number came in, with its beautiful illustration of *Lygodium palmatum*, I also received a fine specimen from Somers, Ct. Your history of the fern had an added interest to me, because I am almost sure I have in a lot of ferns from Japan, unnamed, a *Lygodium Japonicum*. It is a sterile frond, so that identification cannot be complete, but I hardly see how it can be anything else.

What a feast of knowledge is in store for me these coming months if I live. My botanical correspondents are the wiser for my reading the magazine."

TWIN EARS OF CORN.—"I think I have somewhere read that a single stalk of corn cannot produce two ears, one of which has 8 rows and the other 12. I have in my possession two ears taken from one stalk this fall, one of which has 12 rows and the other 8, with 3 short rows tucked in at the butt, about one inch long.

"Perhaps you may think there is some mistake about this; but I know there can be none, for I still keep the ears and they will show for themselves.

My own brother husked them and saved them for me, knowing that I was always looking for curiosities." TIMOTHY WHEELER.

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Twin ears of corn—united in some portion Siamese fashion—are not uncommon. We do not know that two ears wholly separated, as Mr. W. describes, have been before noted. It will interest morphologists to inquire why one should be 12-rowed and the other only 8.

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Haddonfield, N. J.

A DEER'S-HEAD GROWTH OF A WHITE OAK.

These peculiar growths can often be accounted for when an examination is made on the spot, and with a fair knowledge of the usual phenomena of the growth. But an explanation could not be very well offered from a study of the picture alone.

ANNUAL WOOD CIRCLES IN TREES.—A Memphis, Tenn., correspondent says:

"There is an argument as to the age of a Cotton-wood Tree grown on the made lands of the banks of the Mississippi River. They want to show that the tree is 50 or more years old. They had the oldest tree cross cut and brought into court. I was called on, and counted 36 rings; but contend that *a ring is a growth*, and many trees make two and even three growths a year, showing a ring each growth. A Yellow Pine I had cut down here, that *I knew to be 25 years old*, had 75 rings, showing three growths a year. Now what do you say?

"Again, some of those interested (*Hooseers*) say each ring, as they know it, counts a year. Again, they say *when the sap goes down* it forms a ring, and that only once a year.

"Now I contend, and from my learning back to 1835, that the sap going up forms the growth,—the wood and the ring; *but the sap does not go down*. There is nothing to go down. It is utilized,—made into wood until another start to make anew. And so one, two and often three a year. *Now what do you say?* Do you remember reading the very celebrated

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Sap does not ascend and descend in the manner it was supposed fifty years ago to do. All of us have learned much since then, and have to learn much more, for there are still some obscure points. We all read too much and observe too little. It is the easiest thing in the world to test the question raised by our correspondent by measuring a tree daily through the growing season. If there were two or three distinct growths there would be two or three halts in the progress of the figures. The senior Conductor kept a record in this way on some Carolina Poplars. There was not the slightest variation in the figures until a few weeks past midsummer. The whole new circle of wood was completed in one effort, not extending over two weeks. The record is published in the Proceedings of the Academy of Natural Sciences of Philadelphia, in one of the volumes in the early sixties. Last year, one of the clerks, in the office of the Meehan Nurseries, kept a record on a large Silver Maple, near the office; commencing June 12th and ending November 24th. The girth was 55 inches at the commencement. There was not a hair's-breadth of increase till the 18th of June, when a sudden increase of one-sixteenth was found. It then continued at the regular rate of about one-sixteenth of an inch increase in girth every five days until August 13th, when 56¾ was reached. This was the end of the increase in girth for the season. The senior Conductor has often counted the rings of old trees, the ages of which were known, and the correspondence was close.

In some cases there does seem to be fine lines within the larger ones, and without some caution these may be mistaken for the rings winding up the annual growth.

It may be asked, here, how is the line formed, by which we trace the annual growth? The old notion was that wood was formed out of elaborated sap. We now know that only that which has life can give life. "All things from an egg" is the form in which this is expressed. No elaborated sap could originate a living cell. New wood cells are formed from the older cells, and the elaborated sap supplies the food. On the 18th of June, in the experiment above cited, the mother cells holding over from last year brought forth a new brood of cells. These younger ones again brought forth others, and so they kept on continuously—the older giving birth to younger—till the 13th of August. By this time the leaves ceased to prepare food. Without food, the cell growth ceased for the season.

When food becomes limited, the cells are smaller. When they renew growth with abundant food around them, they are large. The smallness of the cells make a darkish line between the broader cells. This is all that constitutes the line. A sudden deficiency in the food supply during active growth will lessen the size of the cells, and give the appearance of an "annual line;" but the renewed growth shows a gradual increase in size, and not the abrupt connection between large and small which marks the whole growth of one season and the beginning of the new. As to the ascent of the sap, there is a continuous flow of sap from the roots to the topmost twig to supply evaporation and transpiration. There is no evidence that sap descends; but something descends, for the food which nourishes the germinating cells contains elements which can only be procured from the atmosphere through the medium of the leaves of the tree. Just how all this is brought about has never been demonstrated to the satisfaction of the writer of this paragraph, but it is clearly the case, nevertheless.

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NEST OF THE CHIMNEY SWIFT.—While I am not prepared to say that the chimney swift does not use vegetable gum in the construction of its nest, I can yet certify that in ten years observations upon this bird in a locality where they are very plentiful, I have never seen one instance in which the bird was seen in the act of gathering cherry gum. The swift is a bird of the higher air, and unlike the other swallows, does not alight on houses or on the ground. In fact, to see a chimney swift on the ground or the trunk of a tree would be remarkable enough to "make a note of." Now this cherry and peach gum usually is found only on the trunks and larger limbs, and I venture to assert that no one ever saw a swift in such a situation.

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In this section, the swift very frequently nests in barns and sheds, and sticks its nest to the flat surface of a board usually in the gable. I have had the opportunity to watch the construction of such nests from beginning to completion, and found that it takes much longer than it does many other birds' nests. A noticeable feature of the work was the fact that the birds would cling to the wall near the nest for an hour or more, *and then go to work on the nest!* During this time they may have been dissolving the cherry gum, but to me it seems much more likely that they were gathering the saliva with which to advance the building. One who has examined the swift's nest closely will be struck with the multitudes of fine slender threads of the glue, which it seems would be hard to produce from cherry gum. A chemist of my acquaintance recently told me that it would require rather complicated experiments to distinguish between vegetable and animal gums of this kind.

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such a lump of gum could be so formed by the saliva of a bird. They believe it to be vegetable gum, and to belong to some member of the plum or cherry tribe. They further suggest that different authors have located the gum-bearing glands in different parts of the bird's body, thus suggesting the thought that they are describing imaginary organs.

The other side contends that circumstances indicate that the gum is really furnished from the bird, and that there are difficulties, from the habits of the bird, in the way of conceding the vegetable origin of the gum. One, not yet taken up by any of our correspondents, is the difficulty the bird would often find in detaching the gum. Gum is very abundant in the Red Cherry of New Hampshire Hills—*Prunus Pennsylvanica*. The senior Conductor remembers seeing a mass, as large as a goose egg, on a comparatively small branch, which appeared as if it might come away easily, but it would be a tough job. A bird could not accomplish it. The whole subject requires direct and careful observation. Surmises will not settle the interesting questions.

APLECTRUM HYEMALE.—May not the "subterranean vegetable growth" described in the January number be that of *Aplectrum hyemale*? In mid-summer, it shows no vestige of foliage. The root is a thick, globular bulb averaging an inch in diameter, and a new one is formed each year; but, as the old corm lasts a year or two before it shrivels (though never again destined to produce foliage), there are usually two and sometimes even three or four of these corms horizontally connected, as described, by the fibrous cord.

In autumn, each new corm sends forth a single ovate leaf, several inches long, and conspicuously marked with longitudinal veins of glistening white; and despite its habitual shriveled appearance, it is really quite a pretty plant. The leaf remains green through the winter, and in May a spike of dingy flowers, resembling those of the Coral Root save that they are spurless, appears. After the seed ripens, the leaves disappear; and no outward sign of its presence is visible until the renewal of leaf growth in the following autumn.

The corms are filled with a glutinous matter utilized by our grandmothers in mending broken crockery; this quality has given to the plant the name Putty-root. While the fact that the corms most frequently appear in pairs has gained for it, one of our strangest orchids, the appellation Adam-and-Eve.

BESSIE L. PUTNAM.

The communication in the January issue seemed to refer to two distinct productions. One lying flat just beneath the surface, covering a space two feet by three, and not averaging two inches thick. On a venture this was referred to *Ipomœa pandurata*.

The "two round bulbs" referred to may be the Putty-root as suggested by Miss Putnam. A large number of terrestrial orchids have twin roots, such as described. Indeed the tribal name orchid is derived from a Greek term expressive of this didymous character.

HABITS OF THE CHIMNEY SWALLOW.—Anent the chimney swallow, I accept your invitation to "come forward" to give my observation on the subject. I have frequently seen these birds "breaking twigs;" not, however, in the way you imagine or suggest, by taking a twig on the fly at full speed at the danger, as you say, of breaking their necks. The tree selected is always a dead one with dry, brittle twigs. They hover on the wing for a few moments before the end of a twig, snipping off a small piece with ease. Only last spring, in New Hampshire, did I see this done and so near me (just over head on a dead apple tree) that I heard the snap of the small piece of twig. I supposed this habit was well known and frequently observed.

About the "Vegetable Gum," I know nothing as I have never examined one of their nests.

In your answer to Mr. Van Denburg, in the last MONTHLY you say: "If the bird in question is not a Barn Swallow." Is not this rather hard on your correspondent? No one who knows birds and takes the pains to write about them would ever confound a barn swallow with a chimney ditto. STEPHEN PARRISH.

Philadelphia.

On reflection, it would seem that, without intending it, the remark, referred to by Mr. Parrish, may seem rather hard on Mr. Van Denburg. As Mr. V. was writing of what he had seen and not what he had read about, the remark, if it could bear the construction put upon it by Mr. Parrish, would certainly be gratuitous.

GENERAL GARDENING.

A BED OF ROSES.

Fresh from the bath Zenobia lies,
A languid beauty in her eyes,
Which flash not now with genius fire,
But softest love alone inspire.
Around her scattered amaranths lie,
While silken cushions heaped on high
Support her form as she reposes
Upon a divan stuffed with roses.

—MARY BAYARD CLARKE.

SEEDS OF THE MOUND BUILDERS.—Referring to the improbable story of the mound builders' six hundred-years-old-corn, a Chicago correspondent says:

"I have always said that the seed obtained of our seedmen were too fresh. Why don't they mine for old seed, as they do for silver and gold. They might strike some mound builders' granary once in a while. Mr. Graham can now distribute a new (old) variety and urge its use in making a new style of Graham bread."

FOREST LAWS.—As a general rule, any measure that will result in a new batch of officials, and give the professional politician a good grist of appointments, finds favor with legislators. Forestry laws always meet with favor from this class wholly aside from any merit there may be in the laws themselves. Almost all legislatures have forestry laws before them at every session, some of which pass, —but unless there is some appointments to be made, they are generally dead letters. Over a quarter of a century ago, the Legislature of Pennsylvania passed a law for the protection of forests from fire, but no one ever heard of a single effort under it. It is as follows:—"The Act of June 2, 1870 (P. L. 1356), makes it the duty of the County Commissioners of the several counties to appoint persons under oath who shall be required to ferret out and bring to punishment all persons who wilfully or otherwise cause the burning of timber lands, and to take measures to have such fires extinguished where it can be done, the expense thereof to be paid out of the County Treasury."

POISONOUS HONEY.—Mr. A. Newlin Williams, of Solebury, Pa., writes:—"Not long ago we were discussing bees and honey at the Solebury Farmers' Club, (Bucks County.) One member said he thought bees would never gather honey from poisoned flowers, but I have had an incident brought to my notice which would seem to prove the contrary. On a visit to Long Island, last summer, I recognized what quantities of stagger bush (*Andromeda Mariana*) grew on the plains. They call it 'kill calf' up there. The reason for the name may be easily guessed. Besides being a 'calf-bane' it is also, indirectly, a 'man bane' through the agency of the bees, for apiaries have now been neglected many years for the reason that the honey is poisonous. There can be little doubt that the racemes of the little white bells hold nectar in their cups which is grateful to the bees, but which is baneful when set between human lips."

Does this statement amount to proof?

The writer has always had doubts about all poisonous-honey stories, from that recounted by Xenophon, to the "kill-calf" experience. Bees are affected by the same poisons that operate on men and other animals, and that which would poison a man would surely kill a bee. It is incredible that bees would collect and store that which would kill themselves. The race of nectar-loving creatures would soon come to an end if they fed on poisonous secretions.

But supposing there were some slight poisonous elements in some samples of honey, it would take a larger quantity of honey than a human being usually indulges in to make a man die. The verdict should be suspended yet awhile.

That people, even the army of Xerxes, should get sick after eating honey may readily be believed. They are often sick after eating mince pie, or after eating almost anything,—and many have been taken sick after eating nothing at all. That too much care in such investigations cannot be exercised is evident.

A F :E OF NORWAY SPRUCE.—Some have an i tnat a plant that naturally grows to a large tree is not suitable for hedges. This would be correct if no art is employed in the management. But a plant which has its annual growth shortened or trimmed before it is mature never gets beyond our desire. Indeed, a plant from the tree class will make a more durable hedge, and be a good hedge in a shorter time than if a plant from the class of shrubs is selected. Among deciduous trees, the value of the honey locust and osage orange for hedging is well-known. The hemlock spruce and arbor vitæ are also in much request among evergreen trees. The Norway spruce is equally as good, though not so often seen. The illustration on page 47 shows one, from a recent photograph, growing near Wyncote in Montgomery County, not far from Philadelphia. As a proof how long a well-cared-for hedge of Norway spruce will last, it may be said that it was planted forty years ago, under the direction of Mr. William Saunders, now of the Experiment gardens at Washington,—and one of the three commissioners to whom so much praise is due for the admirable street planting at the Nation's Capital.

NELUMBIUM LUTEUM.—In a recent issue of MEEHANS' MONTHLY you give a very interesting account of the reproduction of *Nelumbium luteum*. There is a lake (Grass Lake) in the western part of our county, where a very small bed of them was known in the early days of white settlement. I remember calling your and the late lamented Dr. Warder's attention to them when on one of your visits about 20 years ago. At that time the bed was very small, possibly not over 25 blooming plants in a season, and known to very few. They were reputed to have been planted by the Indians, who were fond of their tubers. The lake is thickly grown up with wild rice, which was collected in large quantities, and possibly the *Nelumbium* also, by the Indians. For the last 20 years the lake has been a favorite resort for hunters and trappers, as there were thousands of muskrats there. They are now very rare; but every year the *Nelumbium* "bed" has spread, until now there are over a hundred acres of them. I believe the muskrats kept them from spreading more than the Indians did. I have fished for the tubers with a long-handled rake for hours, but with indifferent success, getting very few tubers and those very small ones. I have succeeded in germinating only one seed in thousands tried. Have sown hundreds in other parts of the lake where conditions appeared exactly like the parent bed, but none grew.

THOMAS H. DOUGLAS.

Waukegan, Ill.

Between 1850 and 1853, when the writer of this paragraph was experimenting with the great Victoria Water Lily, which he subsequently brought to flower for the first time in America, the seed all failed to grow until he bethought to file the outer coating of the seed clear through to the inner flesh or cotyledon. After this they sprouted in a few weeks with the greatest ease. He successfully practised this later with the Egyptian Lotus, *Nelumbium speciosum*.

RELATION BETWEEN LEAVES AND FLOWERS.—Miss Bessie L. Putnam notes:

"Your statement in November MONTHLY, regarding spring flowers in fall, recalls the fact that last summer a hail-storm occurred in this neighborhood, so severe in *streaks* that it in some instances denuded apple trees of their foliage; these trees blossomed again a few weeks later. The practice of picking the foliage from the lilac on the first of August, to secure autumn flowers, is not uncommon, and is, so far as I know, successful."

These notes are useful in explaining that with an early loss of foliage plants will flower again. Flowering in autumn by plants that normally blossom in spring is usually attributed by superficial observers to a mild season, when really the explanation may be the reverse. A season favoring a premature loss of foliage, or accidents such as fungus attacks destroying or injuring leaves, are among frequent primary causes. Crows'-nest branches, or "witches' brooms," as they are popularly called, on various trees never bloom, simply because the fungus attacking the tree operates in spring. The shoots which would make flower buds are destroyed, and the secondary branches following the destruction of the young tips, and which push out from all the axillary buds that would have been flower buds, have not time to form flower buds before the growing season closes. These "brooms" are common on the Nettle Tree.

RETINISPORA SQUARROSA.—One of the most striking of the comparatively modern introductions from Japan is the greyish-green evergreen known in nursery catalogues as *Retinispora squarrosa*. This has enabled a photograph of it to present a peculiar light appearance in contrast with the darker Norway Spruces which are growing around it. This peculiar tint of green is very acceptable to the landscape gardener, who is generally on the alert to take every advantage of light and shade to produce pleasing effects from the arrangement of plants.

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"The introduction of the Cow Pea in America is supposed to be coeval with the landing in Florida of the early discoverers of that country, and whose vessels contained, beyond doubt, this vegetable among their stores. From this source the Indians obtained the seed,

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INTENTIONAL SECOND EXPOSURE

and thus we may account for the name of "Indian Pea," sometimes given to this vegetable. Subsequently, numerous sub-varieties were originated, until there are to-day upward of thirty distinct kinds in cultivation in the Southern States.

The origin of the Cow Pea has, beyond question, been traced to China, whence it was first introduced in the South of Europe. Its sub-tropical origin had confined its cultivation to a few sections of Spain, Italy, and the South of France; and thus its area of successful cultivation belongs properly to warm climates.

In a few districts of Southern France, three varieties are cultivated.

First.—*Dolichos unguiculatus*, or Black-eyed Pea, which is the parent of our numerous sub-varieties of field varieties having long running vines.

Second.—*Dolichos Soja*, or Bush Speckled Pea, from which our Speckled, Bush and China Peas have descended.

Third.—*Dolichos sesquipedalis*, or our garden variety, known as Yard Long Beans, whose peculiarity consists in its very long pods, which are used as snap beans.

The Egyptians cultivate extensively the *Dolihcos Lablab*, which we know here under the name of Hyacinth Bean, and which is so often seen covering the porches of our country houses. It is here used solely for ornamental purposes, but may be found useful in agricultural economy, if properly experimented with.

The two types first mentioned are then the sources from which our numerous varieties have been produced, and the intermixing of these has given varieties with greater or lesser extent of vines, and careful selection is needed when planting a crop for a specific purpose.

The varieties preferred for forage are the plain or semi-colored, which, being of spreading habit, are best adapted for that purpose. Among them we find the "Red," "Clay," "Black," of the plain colored kind; and the "Whippoorwill," of the semi-colored. The White Field," "Lady Pea," etc., are very desirable varieties, but they require better soil than the former, and are not so well adapted for general field crops. The "Red Ripper," or "Tory," is esteemed in certain localities for its easy keeping qualities and its faculty of the seed remaining sound in the ground during winter.

The varieties most in demand for market and table use consist mainly of the "Speckled" or "Bush," or "China Peas." Their habit of growth, as indicated by one of their many names, is bushy, and thus are unfit and undesirable as forage crops. As stated before, hybridizing of the two types among themselves has given rise to many varieties, which partake of both parents, as to habit of growth or color of the pea; thus there are sometimes found speckled peas with long vines and spreading growth; but these peculiarities of growth can only be found out when growing; hence, when purchasing peas for a forage crop, it is prudent to confine our selections to the plain or semi-colored kinds.

The "Lady Pea" is the best flavored variety of the genus, and is often used for culinary purposes, either in a green stage of growth as snaps, or when dried for soups, or baked as is the garden white bean."

It may be noted that in the *Index Kewensis*, which we suppose, like Webster or Worcester in general language, we shall have to follow, *Vigna Catjang* is the name adopted in the place of *Dolichos urguiculatus*,—Dolichos Soga, is *Glycine Soga*,—and *Dolichos sesquipedalis* is retained. Catjang and Soga are the Asiatic vernacular names which have been retained by botanists.

BIDENS BECKII.—A correspondent from New York City sends a specimen, of a plant growing in a parlor aquarium, to ask for its "common name." A friend procured the Latin name from a botanist as *Bidens becki*, but could not get at the meaning for his visitors. It appears to be correctly identified, though we did not know that the plant was employed in aquarium work There is no common name so far as known, as the plant has not been in common use. The "botanist" was probably misled by the practice of some moderns of dropping the capital from a man's name. There is no Latin word *beck*, and it is no wonder the student was puzzled over the meaning. It simply means "the *Bidens* named in honor of Mr. Beck." Older botanists would suppose the owner spelled his name with a capital—Beck. Just why some botanists desire to spell these names in this way, we never knew. The "botanist" would have seen at once that "beck" was a proper name if it had been properly spelled.

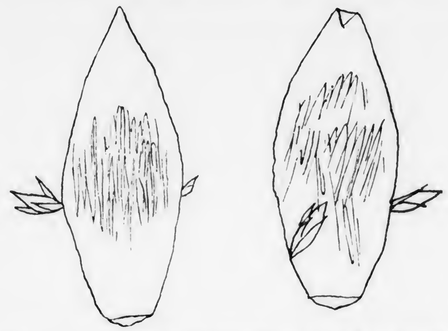
CULTIVATING NATIVE AMERICAN PLANTS.—Parke, Davis & Co., the well-known dealers in drugs of Detroit, believe that the plants used in the drug business are still so abundant, in a wild state, that there is no chance for any one of them to be cultivated to a profit for some time to come.

DISEASES FROM ROOT-FUNGUS.—The attention which MEEHANS' MONTHLY, and in former times the *Gardeners' Monthly*, called to the work of *Agaricus melleus* on the roots of peach, pines, spruces and other things, resulting in a weakened vital power as shown by a yellowing of the foliage (in the peach—"the yellows") followed by a growth of twigs of such low vitality that the twigs would die under slight winter frosts, is resulting in good work.

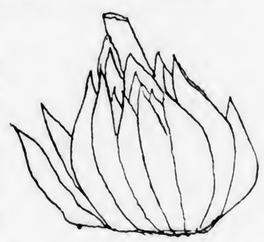
Baron von Mueller states that another fungus, *Tremetes radiciperda*, acts in a similar way in Australia. He further states that the Scotch Fir and the larch suffer in Scotland from *Agaricus melleus* just as the peach and other things do here. He has recently had a letter from Prof. Frank, of Berlin, saying that owing to the attacks of *Agaricus melleus* on the larch plantations they have been looking for some tree the roots of which are not in favor with this serious depredator, and it is believed the Yellow Locust, *Robinia pseudacacia*, will be a success in this respect. In the observations of the senior Conductor of this magazine the peach, apple, White Pine, Bhotan Pine and the Norway Spruce are the only species seen to suffer from this root-fungus. It would be worth while to have more extended observations. The fungus seems to get its first start from rotten wood, spreading subsequently to healthy roots. The Norway Spruce takes the fungus very easily. It was used by the Conductor in his earlier experiments. A few shovelfuls of earth with the roots of a peach afflicted with the "yellows" placed in the ground about a Norway Spruce would be nearly sure to give the "yellows" to the Norway Spruce the next season following. The peculiar ferment, which permeates the tree so attacked, seems to follow the individuals raised from it either by cuttings, seeds or grafts.

This Agaric is probably the worst pest the cultivator has to contend with. To avoid half-rotten wood in the soil, is the best safeguard.

BULBLETS FROM LILY SCALES.—The botanist usually explains the formation of new bulbs in the lily family by saying that they are formed in the axils of the leaf-stalks. That this is not always true is proved by some bulbs of *Lilium candidum* which I set out last fall.



These had a great many small bulblets springing from near the edge of the bulb-scales on the inner surface of the scales. They were an inch or more from the axils. Some of the bulblets showed considerable growth, having two or more scales of their own. I enclose drawings of the bulb and scales.



WILLARD N. CLUTE.

Binghamton, N. Y.

This interesting note shows that when a leaf is so modified as to become a bud scale it still retains a power possessed by true leaves, in exceptional cases, of forming buds outside of the usual axillary position. Some begonia leaves, and the leaves of the *Bryophyllum* or "live for ever" of Florida, will make buds from the ends of the veins, just as these lily scales have done.

A DOUBLE MAYWEED.—Miss Bessie L. Putnam says:

"I had two plants of double mayweed this year—the finest one was self-sown from last year's experiments (you perhaps recall my sending you some of those ligulate heads a year ago for seed). I have since sent blossoms to several botanists, none of whom had ever seen

it before. I hope I may succeed in making the variety permanent."

A double composite is simply a flower in which the disk floret has strap shaped, instead of tubular, florets. A large section of the order are therefore naturally double. The dandelion is a familiar instance. A remarkable fact, and one of which no use has been made by those who write of evolution, is, that while there is a constant tendency of the species with tubular florets to produce strap-shaped ones, there is absolutely no tendency in the strap-shaped ones to assume the tubular disk form. No one ever heard of a dandelion becoming "single"; while the daisy, dahlia, chrysanthemum, and others well known, often become "double."

SILICATES AS MANURE.—A Chicago correspondent says :

"Some twenty or more years ago, some firm in or near Baltimore sent out a fertilizer composed in whole or part of a diatomaceous earth, the fossil microscopic diatoms being composed entirely of silica. This earth came from some deposit in Maryland. Do you know if it is still sold, and where it can be obtained? Scientists say that these small fossil skeletons, of many shapes,—stars, rings, discs, etc.,—form to a great extent the outer coating of wheat, rye, etc.; that experiments have been made, where this, or rather a diatomaceous earth, had been used,—that the macerated straw, under a microscope, showed the diatoms unchanged in form. A friend of mine, who is experimenting largely in chemical manure, chiefly in solution in growing Chrysanthemums, intends trying some form of silica, and I suggested this earth. If the Chrysanthemum will take the silica and use it to build up its stem, the question of a stiff stem may be solved. I understand that Fuller's earth contains a large percentage of silica. Have you ever known this earth used in the cultivation of plants? Can you give me any information as to the best form to convey silica to a plant?"

Several years ago it was pretty well demonstrated that mineral matters, that had once entered into the structure of plants or animals, were more readily taken up by plants than when presented to them in an original condition. Thus, for instance, potash supplied by wood ashes was much more valuable as a manure than potash from decomposed feldspar. This should hold good in the present case. It is doubtful, however, whether the diatoms could retain their forms after their substance was assimilated by the plant. Perhaps others may be able to give more specific answers.

NEW OR RARE PLANTS.

FUNKIA UNDULATA FOLIA VARIEGATA.—This is a highly recommendable little plant for forcing in winter. Planted in boxes and placed under benches, with a temperature of 50 to 60°, it will soon be a surprise to every observer. The plant can be forced right away, without being rooted again.

The leaves—and they are the only valuable part of the plant when forced—are beautiful, having white, green and yellowish stripes; they are daintily curled and do not wither readily,—a very important factor in the arrangement of flowers. *Funkias* are perennials,—often named as *Hemerocallis* in mistake.

ALB. MILLARD.

SPIRÆA ANTHONY WATERER.—Among the new shrubs to be introduced here this spring is the *Spiræa* "*Anthony Waterer*,"—a sport from the *Spiræa Bumalda*, raised by Anthony Waterer, Knap Hill, England. It has the same character of growth as the *Bumalda*, but it is much freer in blooming, the flower heads are a great deal larger, and they are of a brighter pink color than the parent. The Conductors saw some of the original plants at Mr. Waterer's nursery, the past summer, and were much struck with the beauty of the plant. Its low-growing compact habit makes it useful for planting in small shrubbery beds.

PSEUDOPHŒNIX SARGENTI.—Up to recent times, the *Washingtonia filifera* was regarded as the rarest member of the palm family indigenous to the Union. But the more recent discovery, *Pseudophœnix Sargenti*, is now conceded to be the rarest palm of the United States, if not in the world, occurring as it does only in one or two of the more southern "keys" of Florida; discovered by Prof. Sargent a few years ago, but up to now hardly known in collections, seeds being very hard to obtain. It has recently been distributed by the South California Acclimatizing Association.

CARYOPTERIS MASTACANTHUS.—In the February issue of MEEHANS' MONTHLY for 1895, there was an illustration of a new shrub from Mandchuria, *Caryopteris Mastacanthus*.

It has been on the grounds of the Meehan Nurseries for several years past, and has created a very favorable impression. In spite of the drouth during the past summer, it made a vigorous growth and was particularly beautiful when in flower during August and September.

It is reported to be quite hardy in the New England States and is not injured at all at Philadelphia. It is especially valuable on account of its late blooming qualities,—the flowers expanding at a season when few other shrubs are in bloom.

CARNATIONS.—Some promising new varieties of carnations will be disseminated this spring, and a few of them that have been brought to the notice of the conductors would indicate that the "ideal carnation" is near at hand. A long and stiff stem, large, full and well-shaped flower and a calyx that will not burst, are the main points which go to make up perfection in this flower.

Jubilee is a dazzling scarlet, it has a large and full flower and a strong stem. The foliage and growth resemble Daybreak. It will be sent out this spring by E. G. Hill & Co.

Della Fox is another new variety raised by Myers and Samtman, Philadelphia,—it is a cross between Daybreak and Grace Wilder. It has all the characteristics of Daybreak, both in growth and in flower, but the color is deeper and it is more delicate in appearance.

Bridesmaid is a promising sort disseminated last year by the Cottage Garden Greenhouses. It is also of the Daybreak character. The flower is a beautiful pale pink in the centre, gradually fading to a cream white on the outer edges. This firm also introduced a dark crimson sort last year which they named Meteor. It has a strong growth and a large full flower. The color is that of the well-known variety, Annie Webb.

PYRUS ARBUTIFOLIA.—It is only during the past few years that the wonderful wealth of American trees and shrubs has been appreciated in ornamental gardening. It is not yet appreciated to its full extent; indeed, it is questionable whether there are not quite as many good things standing in the background as have achieved prominent notice. One of these is the shrub now introduced to the attention of the readers of MEEHANS' MONTHLY, *Pyrus arbutifolia*,—or, as it is commonly known where it abounds, Chokeberry. It belongs, as its name *Pyrus* implies, to the apple family, and makes a rather dense bush of about five feet high. The leaves are some-

PYRUS ARBUTIFOLIA.
(Berries red, reduced three-fourths.)

what like the famous Strawberry Tree of English gardens, or *Arbutus Unedo*, and which tree is generally in mind when a botanist names anything "arbutifolia." It has corymbs of white flowers in spring, which are more like minute pear blossoms than apple, though the bright red fruits in autumn have more of an apple character than of a pear. The leaves turn of a beautiful crimson in the fall of the year. The specimen illustrated shows its appearance at the end of November, and is reduced three-fourths.

FRUITS AND VEGETABLES.

PEACH GROWING IN NORTH CAROLINA.—Professor Heiges reports that Tryon, North Carolina, is a great centre for profitable peach growing, and that their principal varieties are the Crawfords, Elberta, Oldmixon, St. John, Amsden, River's, Heath Cling and Stump.

THE SPLENDOR PRUNE.—The new fruits, raised by the successful efforts at improvement made by Mr. Luther Burbank on the Pacific Slope, are already getting into circulation. Stark Brothers are offering the Splendor Prune, which is more than double the size of the D'Agen, which has hitherto been the most popular of prunes.

IMMEDIATE CHANGES BY THE ACTION OF POLLEN.—It seems very hard to settle this question. A correspondent asserts that he has seen a pear tree intertwining its branches with an apple. One branch of the pear had a round fruit like an apple. He is sure the pollen of the apple influenced this form. It is remarkable that those writers who make the strongest assertions, that pollen has this immediate influence, have never made any actual experiments,—while those who have tested the matter directly never had any results. The old English author, Bradley, who wrote in 1724 and asserts most positively that such immediate results do occur, had no other evidence than that he had found various changes in form and character in the same orchard. These parties could see the same changes if they looked where there was nothing to cross with. Mr. T. A. Knight, the famous President of the Royal Horticultural Society of England, told that body, in 1824, that, after all his experiments, he could find no change through the immediate action of pollen. He had found abundant change independently of pollen. He instanced especially a Coe's Golden Drop Plum, which once produced a branch with red fruit, when he had no plum like it to act in the cross. Sabine, the secretary, as famous as an investigator as Knight, after summing up all the evidence up to his time, declares that there is no warranty for a belief that the many curious changes are due to the influence of pollen. He says, as we say now, nearly a hundred years later, "investigation is necessary to discover the real cause of these changes." The probable cause is in the inherent power of all plants to vary, not only in the fruit, but in every part of the plant. Some changes have been noted in crossed seed, but a seed is really a part of the new individual, quite as much as it is of the old one, and one might reasonably look for immediate change there.

WINTER-GROWN VEGETABLES.—It has been the work of MEEHANS' MONTHLY to show that there is good profit in raising fruits or vegetables under glass in the North, in spite of the fact that the milder climate of the South seems to render such success out of the question. Last year it was shown to what an enormous extent lettuce, under glass, was being grown for the Boston market,—and tomatoes are being raised in many places. Possibly the largest venture of this kind is at Richfield, Minn. The houses are of enormous extent, and are heated by a steam engine located four hundred feet away. The *Market Garden* tells us of its success the past winter:

"There are 38 beds running north and south with a row of tomato vines on each side of the pipe supports, and 39 plants in a row, making 2,964 plants in all. The vines are 16 ins. apart in the row, with a space of 30 ins. between rows. The beds are seven feet wide, with a 12-in. path between them, leaving an open space of five feet between every other row. Two main rows of two-inch water pipes, running east and west, with a faucet at every bed, furnish complete irrigation facilities. The seed was sown August 1st, and the plants set out September 1st. During the first week in November the first fruit was picked. The vines have been trained on cords or wire and are now nearly 10 feet high. 3,000 pounds of tomatoes have been picked thus far, and Mr. Busch estimates that he will get 8,000 pounds more by the end of the season."

This was only up to the middle of December, when Florida tomatoes were selling in Chicago for between three and four dollars for a four-basket crate.

TOMATO CULTURE.—Many methods of supporting tomato plants have been suggested. Inverted (⋀) trellises are frequently used with good results.

THICK SKINNED ORANGES. — "MEEHANS' MONTHLY states that the question was asked an orange grower why they continue to produce thick-skinned fruit when the demand is greater for the thin-skinned varieties.

The reply was 'that the public would give no more for a box of thin skins than for a box of thick ones—and, as there was consequently more profit in growing orange skins than in growing orange flesh, the skins carried the day.'

The MONTHLY goes on to say:

'We have never heard such an explanation before, and this may be only 'chaff.' Still, the great question remains, why do orange growers graft and plant thick-skinned sorts, when the thin-skins are preferable?'

We assure Brothers Meehan that the grower referred to was conversing largely through his sombrero. The writer has had much experience among orange growers in Florida, California and in orange growing countries outside of the United States, and yet never knew a grower to recommend or plant a variety because of its thick skin. To say that growers generally prefer thick-skinned fruit for the reasons stated in MEEHANS' MONTHLY, is absurd to the last degree. Every effort is made to reduce the thickness of the skin on the favorite varieties, and one of the great triumphs believed to be scored by Mr. Thomson in his 'improved Navel orange' is in producing a thinner skinned fruit. To say that the thin-skinned varieties are less prolific, is equally absurd, so far as California at least is concerned. Absolutely the most prolific orange grown in California is that known as the 'paper rind' St. Michael, from the thinness of its skin. Growers may continue to produce thick-skinned fruit; not because it is thick-skinned, but because it has other qualities which recommend it as superior to the thin-skinned sorts. This is the only practical reason why thick-skinned oranges are produced; and nine-tenths of all growers would be only too glad to dispose of all the skin possible, as well as seeds, in all varieties of oranges produced.

It has been remarked a thousand times by California growers that if the paper rind St. Michael were a seedless orange it would be the most profitable variety to grow because of its small size and its thin skin. Many regard it as the most profitable orange, in spite of its large number of seeds, and solely because it is prolific, thin-skinned and of small size."

The above kindly correction is from the *California Fruit Grower*,—and now MEEHANS' MONTHLY riseth to inquire what are the peculiar qualities which are of value to the grower of a thick-skinned orange? The whole question was stated in the interest of general information.

PARADISE APPLES.—Dwarf apples, properly so-called, seldom grow more than five or six feet high. An occasional one will reach ten feet. When they grow taller, it is caused, as sometimes in the pear or the quince, by the part grafted on the root throwing out natural roots of its own. The Paradise stock is a small species of wild apple, growing in the mountains of Asia Minor, and naturally only a strong-growing shrub. It is the *Pyrus pumila* of botanists. Dwarf apples are very pretty ornaments for small gardens; but the demand is so limited that nurserymen seldom keep them.

CROPS OF STRAWBERRIES.—The Agricultural Experiment Station of Pennsylvania, in Centre County, has been testing the bearing capacity of strawberry plantations. The tests show the second year from planting is the most productive. Proportionate weights of some varieties are given as follows,—they were from plants matted in the rows:

Planted in 1891.	Yield in 1893.	Yield in 1894.
Cumberland	2,902	4,555
Greenville	9,552	11,115
Shuster (Gem),	7,632	14,805
Crescent,	5,287	5,865
Wilson,	5,280	2,445

A PROFITABLE PEAR ORCHARD.—Prof. S. B. Heiges, the Pomologist of the U. S. Department of Agriculture, describing a visit to South Haven, Michigan, says:

"The pear orchard of Charles S. Mills, near South Haven, was the finest that ever came under the observation of the writer. The trees were about 8 years old, mostly Angouleme (Duchess), and in 1893 the entire crop averaged $5 per barrel in Chicago; in 1894, the crop was simply enormous."

MANURE FOR VEGETABLES.—While mineral manures are better for vegetables grown for seeds or fruit, stable manure is preferred for leaf-producing kinds.

BIOGRAPHY AND LITERATURE.

UNSEEN BEAUTIES.

"Full many a gem of purest ray serene
The dark, unfathomed caves of ocean bear;
Full many a flower is born to blush unseen,
And waste its sweetness on the desert air."
—GRAY.

JOEL J. BAILY.—Mr. Joel J. Baily is well-known, not only in Philadelphia, but in many parts of the United States, by reason of his great interest in all philanthropic enterprises in many things which redound to the benefit of humanity. He is also one of Philadelphia's leading amateur horticulturists. His gardens and grounds are always attractive to lovers of fruits and flowers. He has an excellent gardener in Mr. George Fowler.

LONGEVITY OF SEEDS.—Monsieur Casimir De Candolle sends us a copy of his paper on the longevity of seeds. He has found that there is a period of suspended animation, as one might say, and which, if long continued, will enable a seed to live for an indefinite period. One of the essentials to this suspension is a low temperature. This is in accord with the recent observations of others. Deep in the earth, under regular temperature, or under other circumstances favorable to regularity and exclusion from the atmosphere, seeds will undoubtedly live for a long time.

NINE HUNDRED AND NINETY-NINE QUERIES WITH ANSWERS FROM LANDRETHS' BOOK OF INQUIRIES UPON AGRICULTURAL AND HORTICULTURAL SUBJECTS.—Issued by D. Landreth & Sons, Philadelphia. Possibly no commercial enterprises are so flooded with letters of inquiry from customers as those which deal with seeds, trees and flowers. It was a happy thought to issue a work like this. The question that interests one will interest scores of others, and the book is more likely to serve general purposes than could be obtained from a large library. A firm that has been in existence over one hundred years will be an acknowledged mentor.

ERASTUS S. WHEELER.—Though he would be regarded as merely a local botanist, Erastus S. Wheeler, of Berlin, Mass., deserves a more honorable record, for his services to botany and entomology had a world-wide value. He died at his home on December 18th, in the city of Berlin, where he was born on the 15th of December 1832. He was well acquainted with the flora of the whole of our Eastern Continent, traveling continually in connection with the pursuit he loved. He never married.

THE EARLY CULTURE OF THE TOMATO.—A certificate is held by Mrs. Zelia T. Burkart, of Oak Lane, Phila., from the Pennsylvania Horticultural Society, owned by her father Conrad S. Esher, which reads:

"Presented by the Pennsylvania Horticultural Society to Conrad S. Esher as an honorable testimony of his having gained by his exertion and skill the premium for the growth of the best tomatoes submitted to this society this year. Sec., CHAS. PICKERING.
Pres., GEO. VAUX.
'Philadelphia, 1833.'"

Charles Pickering, by the way, is the famous author and botanical traveler.

DR. ALFRED L. KENNEDY.—A quarter of a century ago, no one was better known in agricultural and horticultural circles than that of Dr. A. L. Kennedy. Dr. Kennedy was in many respects a remarkable man. In many branches of science he was among the foremost, and his earnest efforts were directed to turning scientific truths to practical benefit of mankind. For some years he has dropped entirely out of view. It was suddenly discovered, by his tragic death, through the explosion of chemicals, that he had been leading the life of a recluse in a solitary room, still studying and recording results of experiments he had been making. The death occurred on the 30th of January. He was born in Philadelphia on October 25, 1818, and was thus in his 78th year.

BIOGRAPHY.—Among the studies in human life, biography is perhaps the weakest. In the far away past stories are told of great men, that we now know could have never happened. In our own time many prepare their own future histories; and, even in the most conscientious cases, the "best foot is placed foremost." A story is told, in a recent life of the Duke of Wellington, which cannot be true. It is said that the late Mr. Loudon, whom most of us remember as the author of numerous books on trees and gardening, wrote to the Duke for permission to examine some beech trees growing in his garden. It is said that the letter simply asked the Duke to permit him to examine his beeches, without any further explanation, and that it was merely signed C. J. Loudon. English Bishops use their titles rarely. The Duke thought the letter came from "Charles James (Bishop of) London" and read beeches "breeches." He thought, says the story, that the Bishop had a cranky notion to see the breeches he wore at the battle of Waterloo; and wrote to the Bishop that he might see the breeches if his valet could find them. The Bishop, in turn, thought the Duke had gone crazy,—and it was some time before the Duke came to understand that it was not Charles James of London, but Charles James Loudon, and that it was the beeches in the garden, and not the breeches in the old clothes closet, that was the subject of correspondence.

That the story is wholly apocryphal is clear from the certainty that Mr. Loudon's letter would have had some adjectives at least, by which the Duke would have understood why he desired to see the beech trees, which had the reputation of being very fine. There was no reason for writing for mere permission to look at a beech tree, for Mr. Loudon was well-known, and welcome everywhere; but above all his name was not Charles James,—the same initial letters as those which designated the Bishop of London,—but John Claudius Loudon.

REFERENCE BOOKS.—Sometime since a remark was ventured that the comparatively wealthy Massachusetts Horticultural Society would render inestimable service to horticulture and horticultural botany if they would compile a complete index of all the matter ouched on in Hovey's Magazine,—and this might be extended to other serials. The United States Department of Agriculture did valuable service a few years ago by getting out such an index for their reports. But the whole range of literature needs going over in the same way. The thought arises from a kind letter from the Old World, hoping that "Meehaniana" might be collected together before the senior Conductor of this magazine should sit down to rest. But active workers are too busy making history,—but societies might very well do such work.

THORNY PLANTS.—Mr. F. N. Tillinghast sends the following extract, with the comment, "Is it true?"

"One of the uses of thorns is to protect the plant from animals which feed on herbage. Says *La Nature*:

Nearly all plants that have thorns in their wild state lose them after generations of cultivation. It is as if plants brought under the protection of man gradually lay down their arms and trust themselves entirely to his protection."

It would be difficult for any one to furnish the proof of this. The holly and the hawthorn have been under cultivation extensively in the Old World, the seedlings in each generation from cultivated trees, but they are thorny still. If Homer and Sappho, or other ancients who sang so sweetly of the roses a couple of a thousand years ago, were living now, they would find to-day that there was no "rose without a thorn."

AMERICAN GARDENING.—The well-known semi-monthly horticultural serial, *American Gardening*, has become a weekly. It is the oldest magazine, genealogically considered, in existence. When the publisher and proprietor of the *Gardeners' Monthly*, Chas. H. Marot, died suddenly and unexpectedly, *American Gardening* stepped in and purchased its subscription list, as the *Gardeners' Monthly* had before absorbed the *Horticulturist*. The last named was established in 1846 by A. J. Downing. It is a record to be proud of, and on which we congratulate our contemporary.

MODERN ART.—The beautiful quarterly, *Modern Art*, hitherto published in Chicago, is in the future to be issued in Boston by Messrs. Prang & Co.

GENERAL NOTES.

EVAPORATING FRUITS.—There is far too little done in the way of giving credit to the public benefactors,—possibly because so many of them patent their inventions, and the public therefore considers that as we give them an exclusive right to sell their goods, that this is reward enough; but there are many inventions of this kind that are of immense national importance, and it does seem that some honor is due, even though the parties have secured patent rights for their invention. We have this fact in mind while reflecting on the enormous value America has received from those who have worked up good methods of evaporating our surplus fruit. Among these useful citizens prominently stands the name of B. L. Ryder, of Chambersburg, Pa. (The Company is now at Waynesboro.) There can be no question, but that the invention of the American fruit-dryer by this gentleman gave the great impetus to this industry, which has brought this great national benefaction.

FOREST FIRES.—It is many years now since the senior Conductor of this magazine pointed out that nothing could possibly save American forests from serious conflagrations but some well directed effort to get rid of dead brushwood, which everywhere abounds. It is pleasant to note that this seed sown so long ago is now bearing fruit. Secretary Morton has distinctly stated to one of the Forestry Conventions, that there is absolutely no other hope of saving a forest from fire than the removal of the dead brush-wood,—and this idea is now being taken up in forest articles in newspapers, and in speeches in conventions. In the early part of the season it was stated that the losses by forest fires in New Jersey would certainly come up to two hundred thousand dollars. Then, it was stated, that if the State of New Jersey were to appropriate two hundred thousand dollars for the employment of forest wardens, it would be a cheap thing to do. These forest wardens are to have nothing to do but to sit around and wait for the beginning of the fire, and then put it out. If a hundred thousand, or only fifty thousand dollars, were spent in removing dead brush-wood, which feeds the fire, the money would be better spent. But the universal weakness of our people is to think that nothing can be done unless the state has a "finger in the pie,"—not only in forestry, but in many other good efforts. The true forestry policy should be to encourage private enterprise. The state might give a bonus for the best cared-for forest after a certain number of years, and it might relieve forest lands from their share of taxation. In many ways it could be made the interest of owners to plant forests and to care for those which are worth caring for. To our minds, the talk of the forest wardens, and similar state expenditures, are all labors at the wrong end.

MEEHANS' MONTHLY IN LIBRARIES.—So many great works come to an untimely end, that MEEHANS' MONTHLY naturally came under the general suspicion that it would do likewise, as apparently did the "Native Flowers and Ferns of the United States." But it was to continue this great work that MEEHANS' MONTHLY was started. A continuous work, under ordinary publishing houses, is uncertain. The nursery firm of Thomas Meehan & Sons have undertaken it, simply to give assurance that it will be continued for all time. As it must become a permanent work of reference, libraries, with confidence now that the work will be permanent, are looking up back volumes. These early complete sets are getting scarce. There are at the present time less than two hundred sets on hand.

THE DRUGGISTS' TROUBLES WITH CHANGES OF PLANT NAMES.—The druggists are now complaining of the Babel which the wholesale changing of botanical names is inducing. In many cases it is literally a question of life or death with them.

PUBLISHERS NOTES.

Each year the enterprise of the various Nursery Seed and Plant Establishments in the country bring to the front numerous new or rare flowers, plants and vegetables. These firms, who are advancing horticulture in this direction, deserve a great deal of credit, and they should have the support of every enthusiastic horticulturist. It gives the publishers a great deal of satisfaction to note the increased number of these new introductions this year, and a perusal of the following list will show the untiring efforts of these firms for the advancement in this direction.

It would be not only a source or pleasure; but an educational feature for the readers of MEEHANS' MONTHLY to secure catalogues of any of the following firms, and to look over them carefully and to experiment with the new plants or vegetables offered by them. In this way it can be determined just what part of this country the various plants or vegetables will do best, and the publishers can say, on behalf of the horticulture press, that they will always be glad to publish the experiences of those who have tried the various novelties offered by advertisers. A great deal of good would come from this and it is really the duty of everyone to do his or her part towards the advancement of horticulture in some such way as this.

The publishers will hope to hear during the coming summer and fall from those who have tried novelties, as to how they have succeeded with them in comparison with older sorts that have already been tested.

The plants or vegetables enumerated in connection with the name of each firm represents what that firm is introducing, or is making a particular sale of.

Storrs & Harrison Co., Painesville, Ohio. Perpetual flowering hardy rose "Mrs. J. Sharman Crawford," "Clio," New Hybrid "Sweet Brier, "and novelties in Fruits and Vegetables.

Alfred Bridgeman, New York City, N. Y. New Cox-comb "Vesuvius" Nasturtium, "Lilliput," "Scarlet Globe," Radish, "Upland," Cress.

Dingee & Conard Co., West Grove, Pa. Ever blooming Rose, "Princess Bonnie," Crimson Tea Rose, "Mariaon Dingee," Ever blooming Tea Rose "Graziella" Canna "Flamingo."

Jacob W. Manning, Reading, Mass. Lord Penzance Sweet-Briers Spiræa "Anthony Waterer," new Phlox, Japanese Iris and other herbaceous perennials.

J. M. Thornburn & Co., New York City, N. Y. Carnation, "Double Perpetual," Celosia "Ostrich-Feather," "Thornburn Valentine Wax Bean," "Melrose Sweet Corn," "Thornburn New York Tomato," and the "Carmine No. 1," and "Carmine No. 3" Potatoes.

W. Atlee Burpee & Co., Philadelphia, Pa. "Large Red-ribbed" Celery, "Early White Radish," Morse Lettuce, "Cupid" and other improved Sweet Peas, Japanese Asters, "Burpee's Defiance" Balsam, "Fordhook Fancy Fringed Double Petunia."

G. R. Gause & Co., Richmond, Ind. "Queen Charlotte" Canna, improved double and single Geraniums, Geraniums "Souv. de Miranda."

H. W. Buckbee, Rockford, Ills. "Monte Cristo," Water Melons, "Golden Globe" Danvers Onion, "Buckbee's New Queen" and "Christmas" Cabbage, "Colossal" Corn, and "Illinois" Oats.

W. C. Gault, Ruggles, Ont. The "Gault Late Raspberry.

Andorra Nurseries, Chestnut Hill, Philadelphia. "Schweidleri" Norway Maples, "Oriental Plane," "Hypericum Moserianum."

Ellwanger & Barry, Rochester, N. Y. New seedling Apple "Barry," Fall Pear "Lady Clapp," Winter Pear "Dorset," "Crimson Rambler" and "Marchionees or Londonderry" Rose, New Lilacs.

Henry A. Dreer, Philadelphia. "Rogers Lima" Wax-Bean, Double Sweet Peas, "Climbing Meteor" Rose, Water Lilies, and Marguerite Carnation.

Iowa Seed Company, Des Moines, Ia. New "Rose Turnip" Raddish, "Washington Wakefield" Cabbage, "Ideal Mammoth" Rhubarb, Double Morning-glory, "Goldmine" and "Silver-mine" Corn.

Reasoner Bros., Oneco, Fla. Nelumbiums, Nyphæas and other Water-lilies, Tropical and Sub-tropical plants of all kinds.

H. F. Michell, Phila. Michell "Delicious" Sweet Corn, "Non-superior" Evergreen lawn grass seed, Sweet Peas and "Lemon Oil" Insecticides.

Hyre Bros., Dayton, Ohio. Small fruits of every description.

Pike & Ellsworth, Jessamine, Fla. White, night blooming. and red, white and blue ever blooming Water-lilies, Tropical and Sub-tropical plants.

WHEN WRITING TO ADVERTISERS, TELL THEM YOU SAW THEIR CARD IN MEEHANS' MONTHLY.

R. Douglas & Sons, Waukegan, Ills. Colorado Blue and Douglass Spruce, Evergreens and Forest seedlings.

G. S. Josselyn, Fredonia, N. Y. New Grapes, "Campbell," "Early Esther", and "Rockwood" "Red Jacket" Gooseberry.

C. E. Whitten, Bridgman, Mich. "Satisfaction" and "Splendid" Strawberry, small Fruits and plants.

Parry's Pomona Nurseries, Pomona, N. J. "Star" Apple, "Japan Early Reliance" Chestnut, "Japan Golden Russet" Apple, "Bismark" Apple.

A Blanc & Co., Philadelphia. Clematis "Stanleyi" "Climbing Meteor" and "Golden Rambler" Rose, White "Alsace" Canna, Imperial Japanese Ipomæas.

Phoenix Nursery Company, Bloomington, Ills. "Abutilon Souv. de Bonn," Trees, Shrubs and Fruits in great variety.

Keene & Foulk, Flushing, N. Y. Large Maples, in variety, California Privet, Rhododendrons, Aazleas and other choice nursery stock.

T. J. Dwyer, Cornwall, N. Y. Fruit trees and small fruits in variety.

Deming Co., Salem, Ohio. Improved Spraying apparatus for every purpose.

F. H. Horsford, Charlotte, Vermont. Hardy herbaceous perennials and native trees and plants.

G. H. & J. H. Hale, So. Glastonbury, Conn. "Hale" Plum, "Triumph" Peach, "Bouncer" Strawberry.

D. Hill, Dundee, Ills. Evergreens, and Forest seedlings.

Hillside Nursery, Somerville, Mass. Choice vegetable and flower seeds.

W. H. Moon Company, Morrisville, Penn. Rosa Wichuriana, new and rare Fruit and Ornamental Trees.

John Saul, Washington, D. C. Choice new and rare Foliage Plants.

J. A. Salzer Seed Company. La Crosse, Wis. "Salzer's Early Wisconsin" Potato, "Silver-mine" Oats, "Teosinte," "Giant Golden" and "German" Clover.

E. W. Reid, Bridgeport, Ohio. "London" Raspberry, "Keepsake" Gooseberry, "Eureka" Raspberry, "Brandywine" and Timbrell" Strawberries.

Thomas Meehan & Sons, Germantown, Philadelphia. Native Oaks, Japanese Maple, Red-flowered Dogwood and other Ornamental Trees, Shrubs, etc.

NEZ PERCE ✸ POTLATCH ✸ PALOUSE

These are the names of three great agricultural and fruit growing districts in Idaho and Washington reached by the Northern Pacific Railroad.

They each adjoin the other, are similar in poducts, climate and character, and together form a region for a homeseeker hard to equal. The Palouse region has long been noted for its marvelous grain Production. It is to the Pacific Coast what the Red River Valley is to Minnesota and North Dakota.

The Potlatch country is like unto the Palouse, and adjoins it on the east.

The Nez Perce region lies south of the others and has until recently been a part of a great Indian reservation. 500,000 acres of it have been thrown open to settlement and its lands can be bought at cheap prices and on favorable terms, Write to

CHAS. S. FEE, General Passenger Agent
Northern Pacific Railroad,
For folder and rates **St. Paul, Minn.**

ROSA RUGOSA

(JAPANESE ROSE)

We have a large stock of this beautiful Rose; strong and thrifty plants **on their own roots**; suitable for planting in masses. See our new descriptive catalogue which contains a full paged illustration of them, also prices for single plants or in quantities.

AZALEA MOLLIS

(CHINESE AZALEA)

This is the most attractive of all the Azaleas,—the flowers are born in great profusion. We have a good stock of thrifty, well rooted plants. See description and illustration in our new catalogue for 1896.

Descriptive catalogue for Spring, 1896, will be mailed free to old customers, to others for six cents in stamps.

THOMAS MEEHAN & SONS
NURSERYMEN AND LANDSCAPE ENGINEERS
GERMANTOWN, PHILA.

SITUATIONS WANTED.

Advertisements under this head, not exceeding 50 words, will be inserted once for 50 cents, or three times for $1.25.

GARDENERS:—We shall be glad to furnish names of competent gardeners adapted to large or small places. Gardeners wishing situations should correspond with us. THOMAS MEEHAN & SONS, Nurserymen, Germantown, Philadelphia.

GARDENERS—On our register will be found names of Competent Gardeners, and we will take pleasure in sending these to any one requiring their services. Henry A. Dreer, Seedsman and Florist, 714 Chestnut Street, Philadelphia.

GARDENER—English, aged 38, married, small family; 24 years experience in growing orchids, ferns, stove and greenhouse plants, roses, carnations, chrysanthemums; also the management of fruit houses, vegetable and flower gardens, etc. State wages. Chas. Dumper, 119 Tallmadge St., Poughkeepsie, N. Y.

AS GARDENER, by a man of experience and ability, will be disengaged 1st of March next, thoroughly conversant with the management of a gentleman's country estate, unexceptional references for ability and personal character.

Address, J. E. S.
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Toms River, N. J.

HEAD GARDENER—*Estate Manager*—Situation wanted by a theoretical and practical gardener, 27 years experience in Landscape work, cultures under glass or out-doors, all branches of gardening. Best references from *first-class* places. Europe and U. S. February or later, "R. F.," Office, Meehans' Monthly.

GARDENER.—Situation wanted as gardener or general manager of a gentleman's place by a man who has had 16 years' practical experience. Excellent certificates.

Address, W. W.
care of Meehans' Monthly.

GARDENER, 42 years with knowledge of greenhouses and outside management mushrooms etc. Handy with any kind of tools, wife four of a family, two lads able for work about 17 and 18 reference given from present situation with particulars. Address,
T. D. care of Meehans' Monthly.

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To any one sending us 30 cents and six names of friends who might subscribe for our magazine, we will mail our one dollar magazine a full year. At 30 cents we lose money the first year but hope you will continue to be a subscriber, after seeing twelve numbers. If you wish to see the magazine before subscribing, send 10 cents and receive a sample copy and a free gift of an aluminum dime-size charm, with the Lord's Prayer engraved in smallest characters; bright as silver, and never tarnishes. *We do not send sample copies free*, so save your postal cards as no notice will be given them. Subscription price, $1.00 per year. Address,

THE NEW ST. LOUIS, 2819 Olive St., St. Louis, Mo.

FOR THE LAWN and garden there is no Fertilizer so productive, so clean, healthful and free from odor, as

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NEW, RARE AND BEAUTIFUL PLANTS

Lord Penzance's New Hybrid Sweetbriars, Old Garden Roses, New Roses, Standard Roses, Philadelphia Lemoenei, New Lilacs, Lonicera Hildebrandtii, Spiræa "Anthony Waterer," Tecoma Smithii, etc.

A large collection of Rare Hothouse and Greenhouse Plants, Arthuriums, Alocasias, Orchids, Rare Conifers and other beautiful Evergreens, Magnolias, Japanese Maples, with other choice Trees and Shrubs.

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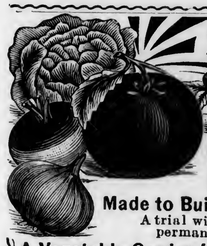

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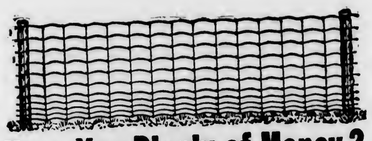

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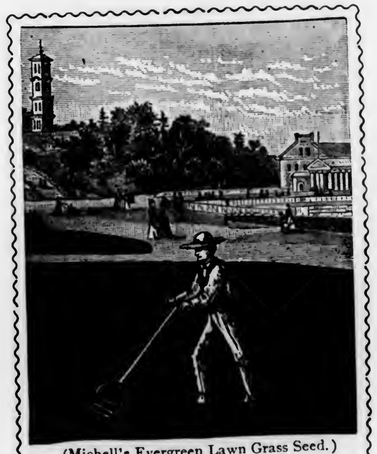

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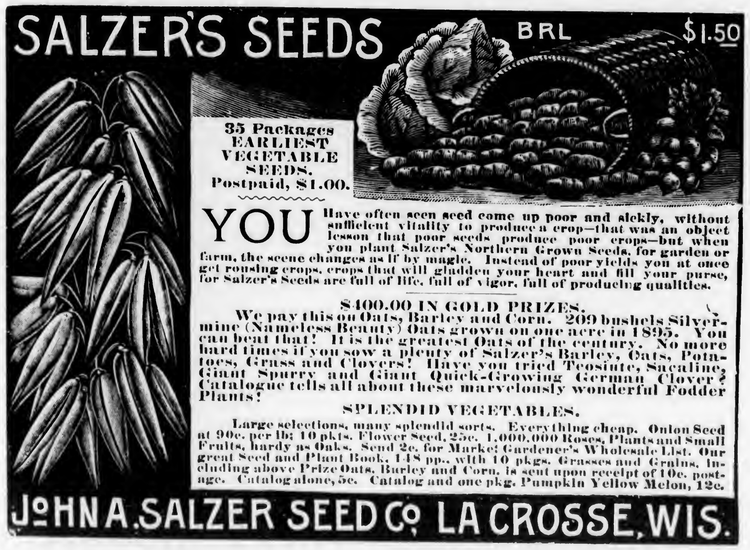

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VOL. IX. NO. 410

GARDEN AND FOREST

A JOURNAL OF HORTICULTURE LANDSCAPE ART AND FORESTRY

JANUARY 1, 1896

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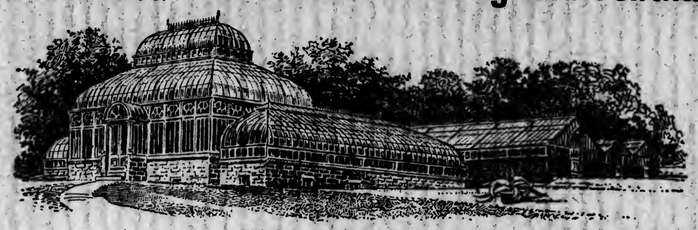

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PHOTOCOPY OF ORIGINAL

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INTENTIONAL SECOND EXPOSURE

AQUILEGIA CŒRULEA.

ROCKY MOUNTAIN COLUMBINE.

NATURAL ORDER, RANUNCULACEÆ.

AQUILEGIA CŒRULEA, Torrey.—Spurs traight, very slender, one and a half to two inches; sepals rhomboid-ovate, acute, longer than the petals; stamens and style shorter than the corolla; stem one to three feet high, glabrous, few flowered; flowers two to two and a half inches in diameter, pale blue, sometimes ochroleucous, pinkish or white. Leaves mostly radical, glaucous beneath; leaflets deeply cleft. (Porter's *Flora of Colorado.*)

There are but few persons who are not interested in knowing how plants come by their names, and there has been much speculation in relation to the botanical name, *Aquilegia*, given to these plants. Most investigators have concluded, as Dr. Asa Gray expresses it, that "the name is derived from *aquila*, an eagle, from some fancied resemblance of the spurs to talons;" but that it is but a very far-fetched fancy is apparent from a glance at the nectaries or spurs in our plate. There is, however, a little more scope for the fancy in the curved nectaries of some of the European species, though very little even there.

But even this does not account for the latter portion of the name, and so some have sought a better explanation in *Aquilegium*, which means a gathering or collection of rain-water, and suppose it was given to this plant because the nectaries are so formed that they might gather or collect rain. But that this conjecture is unsound we may gather from the pronunciation which even from the oldest period that we can trace has been *Aquile-gia*, while the water-gathering supposition would demand *Aquileg-ia*. It seems more than probable that the name is derived from the old story of Ganymedes. Most persons are familiar with the story of the beautiful boy, Jupiter's cupbearer, who is represented on the back of an eagle flying through the air. Jupiter had a daughter, named *Aquilegia*, who was famed for her great beauty, and among her most ardent admirers was the handsome servant of Jupiter, who paid her frequent visits on his celestial bird. It so happened, however, that the maiden was more smitten with the eagle than with its rider, and she gave her heart to the bird. When Ganymedes at length understood the situation, he endeavored to repair matters by hiding the eagle when he came to court the maiden. But this only made matters worse. She pined for that eagle, broke her heart at its continued absence, and died. As was usual in these catastrophes, according to the Grecian stories, Jupiter, grieving for the loss of a favorite daughter, turned her dead body into a flower, and gave it this name after her death,—which means literally that her life was given or bequeathed to the eagle. If this explanation of the origin of the name be correct, it may explain many of the poetical allusions we often meet with in connection with *Aquilegia*. Miss Twamley says:

"Why, when so many fairer shine,
Why choose the homely Columbine?
'Tis Folly's flower, that homely one,
That universal guest,
Makes every garden but a type
Of every human breast;
For though ye tend both mind and bower,
There's still a work for Folly's flower."

And this idea, that in some way the flower represents folly, runs through most of the poetry of the columbine. It is a very old association, for even Shakespeare refers to it in connection with folly. There could be no greater folly than for the daughter of so great a god as Jupiter to die of love for an eagle, who would probably have preferred to devour the lady rather than return her love,—and thus the very old poetical association confirms the conjectured mythological origin of the name. Other poets have made references to the columbine in connection with its early blossoming, for some of the species are found among the first flowers of spring. The morning of the year,—the morning of life; the early spring flower, so sweet to the child,—all these have been typified in the early blooming columbine. As Jones Very sings in his well known lines:

PHOTOCOPY OF ORIGINAL

" The morning's blush, she made it thine,
The morn's sweet breath, she gave it thee;
And in thy look, my columbine!
Each fond-remembered spot she bade me see."

Some of the species are quite remarkable for their early blossoms. *Aquilegia arctica* is in flower in the snow; and, indeed, our Rocky Mountain Columbine has been found under similar circumstances. Mr. T. S. Brandegee, in the fourth volume of the *Botanical Gazette*, remarks that "among the first flowers of spring are many that must live through many snow storms. Last September, after snow had fallen twice, I made two or three excursions up among the high summits of the Sierra Sangre de Cristo, and was surprised to find a great number of plants in blossom in shaded locations and under rocks where the snow had not melted away early enough to give them a good start. They seemed bound to live their lives out, even if they did have a hard time of it and it took a longer time than all summer. *Aquilegia cœrulea*, full of flowers, was standing in the snow." In the Rocky Mountains, especially on Gray's Peak, the writer of this has met with it at from about 7,000 feet elevation up to about 10,000 feet, which last figure denotes the line at about which timber ceases to grow, and the more strictly Alpine plants begin to appear. It seemed to be in about its greatest abundance and beauty at this timber line, though not as luxuriant as when found in lower elevations and in richer soil. The specimen here illustrated was obtained from that spot, and represents fairly the plant as growing there; though in rich garden ground under cultivation, it grows to a larger size than represented here as a native wild flower. Its companions on Gray's Peak were chiefly dwarf yellow composites, *Polygonum Bistorta* and other flowers attractive to bees and insects, which in that very pretty flower garden seemed unusually abundant for the Rocky Mountains. The Humble Bees seemed to frequent the columbine chiefly for the pollen, and, while gathering the pollen from flower to flower, evidently cross-fertilized them.

In the spot on Gray's Peak referred to, there appeared no variation in color. All had just the same purple sepals and white petals as represented in our plate. Other observers have, however, found locations where there were different shades of color. Miss Rose G. Kingsley, writing to the *Garden* in 1876 (Vol. IX), says, in some of the eastern slopes of the Rocky Mountains, she has found plants bearing blue flowers growing side by side with those bearing yellow and pinkish flowers, and every intermediate shades between these two extremes were represented; and Mr. Marcus Jones, in *Botanical Gazette*, reports that he has gathered yellow and blue from the same plant. The prevailing color is, however, purple-blue, as in our plate. Miss Kingsley says "the finest patch I ever found was on the edge of the great pine forest that covers the slopes of Pike's Peak, in Colorado. The flowers were nearly all blue, of an immense size, and shone out from under the shade of the *Pinus ponderosa* like pale blue stars."

Though known to cultivators as the "Rocky Mountain Columbine," there are other species which inhabit this immense mountain chain. One, *Aquilegia chrysantha*, is a brilliant yellow, but with proportionately small sepals and petals, and is thus easily distinguished from this species, which, though said to have sometimes "yellow" flowers, is not the yellow of the other species, but what is technically known as "ochroleucous." The species, however, readily hybridize under the hands of the florist, and there are in gardens such hybrids between our Rocky Mountain Columbine and the Golden Columbine, which combine the features of both. Some have the petals—the inner series of floral leaves—clear sulphur-yellow, and the spurs and the sepals pale blue.

The plant was first found by Dr. James in the Rocky Mountains during Long's exploring expedition, and is described by Dr. Torrey in the volume for 1827, of the Annals of the New York Lyceum of Natural History, so that it is a comparatively recent discovery; and it was subsequently found in the Wind River Mountains on the Fremont expedition. Nuttall found the yellowish form, and in 1834 described it in the Journal of the Philadelphia Academy as *Aquilegia leptocera*, in which he was followed by Sir W. Hooker in the *Botanical Magazine*. Writing in 1864, Sir W. Hooker says "we had it from our collector, Mr. Burk, who found it near Fort Hall. In my opinion it is not only the queen of columbines, but the most beautiful of all herbaceous plants."

EXPLANATION OF THE PLATE.—1. The whole of the upper portion of a small plant. 2. A root-leaf, showing the dilated base of the petiole.

WILD FLOWERS AND NATURE.

AN EASTER MORN.

Welcome to weary hearts its harsh forewarning
Of light and warmth to come,
The longed-for joy of Nature's Easter morning,
The earth arisen in bloom!

In the loud tumult winter's strength is breaking;
I listen to the sound,
As to a voice of resurrection, waking
To lift the dead, cold ground.

Between these gusts, to the soft lapse I hearken
Of rivulets on their way;
I see these tossed and naked tree-tops darken
With the fresh leaves of May.

—WHITTIER.

BEES AND CLOVER.—"I must express my pleasure, with thanks, on seeing in your January magazine, the fact endorsed that clover is self-fertilizing and needs not the agencies of the bumble bee to produce seed. You will kindly allow me some explanation. You doubtless know very well that there are a great many writers, smart with the pen in their expression when repeating what others have found out, and of which they have no idea. It was very provoking to read every little while the story of the Australian bumble bees' performance,—even lecturers referred to it. To be sure before I ventured out with my assertions, I wrote to Mr. L. O. Howard, Entomologist in Washington, D. C., who had on previous occasions given me valuable information; but this gained nothing but the answer that it was out of their line, and he had referred it to the Botanical Division, and doubtless it would be answered from there. I wait yet for it; but meanwhile our Connecticut friend, Mr. James B. Olcott, long an agricultural contributor to our *Hartford Courant*, was sent to Australia in the interest of grasses by the Department. I had the secrect hope that he might too have a little private mission in finding out about the bumble bees. You know women indulge often in all kinds of fancies,—why should not I be interested in the pretty "Hummel," as we Germans call them, who delight me always with their sonorous voices and their industrious habits. I am very grateful that the clover seeding is cleared up in my mind." WILHELMINE SELIGER.

Hartford, Conn.

The comment on copying by bookmakers, and palming ideas off as original, is not too severe on the part of Mrs. Seliger, as all who have to work up original matter know. The absurd statement that "Mr. Meehan has stated that the seeds of the American blackberry never germinate in America," started by somebody's error many years ago, is still appearing in text books. In relation to this bumble bee and clover story, it seems to have originated in a single observation of Mr. Darwin's, who attributed to the absence of insects, what should have been referred to imperfect nutrition. But we shall never hear of the many observations that have been recorded to prove him wrong.

Appended is another note on the same topic.

"I was especially pleased to read the note concerning the bumble bee and clover question.

"I have always thought it a great fraud to claim that bumble bees are necessary to fertilize the clover. For several years past especially, I have thought of it. I have driven, with my horse and pony, long, long drives, through the spring, summer and fall. Great fields of clover bordered the roadside, and as I enjoyed the delicious odor, I always drove slowly whenever I came to a clover field, and watched for bumble bees. How few I saw! It was dreadful to think that those few bumble bees must visit every clover head, and every floret in each head! Always a 'doubting Thomas,' I came to think it simply nonsense to believe it true, and hence my pleasure in your note."

MRS. W. A. KELLERMAN.

Columbus, Ohio.

BLUE CURLS AS FODDER.—Mrs. Seliger reports that the Blue Curls, *Trichostemma dichotoma*, is a favorite food with cows at pasture. It would thus seem that cattle have a taste for aromatics as human beings have.

PHOTOCOPY OF ORIGINAL

TIME OF FLOWERING OF SYMPLOCARPUS FŒTIDUS.—As the first after a New Year of our common plants to bloom, a few notes upon the "Skunk-cabbage" may be of interest. Pursh, writing in 1814, gives its time of flowering from February to April; W. P. C. Barton, in 1818, from April to May; Henry Muhlenberg, in 1818, April; Dr. Barton, in 1825, March and April; Dr. Darlington, in 1837, February and March; Dr. Darrach, in 1853, February.

As all these writers were practically writing of plants for the same section of country,—the eastern part of the "Middle States,"—the variation is the more noticeable.

The writer of this has noted the plant for several years, and is of the opinion that in the section of country mentioned, it never fails to bloom in January. The plant perfects its flower buds in the "fall," and the few "moderate" days seasonable a little before, or a little after the New Year, serve always, it would seem, to open them. On February 13, 1887, February 19, 1888, and February 12, 1893, I found the flowers in bloom by hundreds, fully open, with the pollen dropping. On January 13, 1889, January 12, 1890, December 24, 1893, January 20, 1895, and January 12, 1896, I found the flowers fully developed, with the pollen mature.

Sometimes the flowers open, and are afterwards frozen, as is the case this season, but generally the bloom continues perfect, until the the ravages of nature cause them to shrink and disappear.

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Philadelphia.

INSECT LIFE UNDER LOW TEMPERATURE.—Regarding the paragraph "Insect life under low temperature" at p. 24, our observing correspondent, Mr. Timothy Wheeler, Moscow, Vermont, says:

"Mr. George B. King asserts that 'insects freeze solid during the winter and thaw out when warm weather comes.'

You reply—'This surely has never been demonstrated.'

Allow me to say that I have seen thousands upon thousands of frozen mires, and winged ones at that, while I have been chopping in the woods, and while working up wood-piles at the house.

Often have I carried them into the house, and in a few minutes they would be crawling around as lively as ever. Often I have found a pint or more in a pile all frozen and crystals of ice among them. Hundreds of farmers here would tell you the same. Also fish have been found frozen in ice, and have been put into water, and when thawed out were as lively as ever.

Fish have been caught and thrown upon the ice and frozen there, then put into a pail of water and soon they were swimming around again.

I trust you will believe my testimony. You remark—'If once the power of evolving heat is lost, life goes with it.' Surely I believe this statement, when the '*power*' of evolving heat is gone; but, is it logical to conclude that the *heat* cannot be restored?

My research has led me to conclude that *heat* and *life* may remain dormant indefinitely under certain conditions, and then, under suitable conditions, may be restored.

For many years I have thought that frost *arrests* heat, life and growth simply, and improper thawing out destroys the same.

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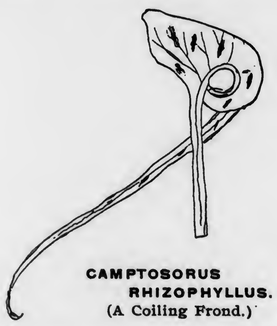
PHOTOCOPY OF ORIGINAL
INTENTIONAL SECOND EXPOSURE

COILING OF A FERN.—The enclosed is a drawing of a very curious shaped frond of the walking-fern, (*Camptosorus*) which appeared on one of these plants in my fern garden. This frond has made two complete revolutions in a plane parallel to the surface of the leaf, or side-wise. The coils begin near the base, and, as far as they extend, only one side of the frond is developed; otherwise it is like any other frond and has produced spores. The coils are nearly flat, and apparently were formed when the frond was unrolling by two revolutions slipping sidewise instead of unrolling toward the tip. WILLARD N. CLUTE.

These occasional wanderings from what we regard as normal conditions are the hints Nature furnishes us to show how variety exists in nature. Most biologists now believe that, in some way not yet demonstrated, one species has been evolved from some other species;



CAMPTOSORUS RHIZOPHYLLUS.
(A Coiling Frond.)

either from another species still existing or from species utterly extinct. Two modes have been suggested,—one, that changes occur through gradual modification through indefinite ages,—the other, that, at some period of the world's history, sudden changes appear, under the impulse of some internal growth force, the nature of which is unknown. Instances such as this furnished by Prof. Clute favor the sudden idea. There is no gradual modification in the twisted fern, and one might say if one frond can curl this way at one time, why may not hundreds simultaneously do so at another?

As to the method by which such changes as these are brought about, we also get a glimpse. Growth in plants is of a spiral character. When a leaf-blade is formed, the spiral development is very weak, but not wholly exhausted. Hence in many plants, especially in Compositæ, and notably in *Liatris* and Compass Plants, we have vertical leaf-blades. This case is another illustration that the spiral growth force was more powerful than usual.

LIFE UNDER LOW TEMPERATURE.—A brief paragraph in the MONTHLY for February holds that it has "never been demonstrated that insects freeze solid in winter and thaw out when warm weather comes;" the writer holding that "when the power of evolving heat is lost, life goes with it," and that "this is a great principle in biology," and 'tis further suggested "there are liquids which do not freeze under a low temperature, and these possibly enter into the insect organization."

Surely, the last remark must be considered entirely gratuitous, until science has demonstrated the existence of such juices in the organization of any well-known living creature.

There are some wonderful provisions of nature for the maintainance of the temperature of the human body at 98½ degrees in winter and summer, whether under the equator or the polar circles. A variation in temperature of the body of 3 degrees below or 8 or 10 degrees above normal generally means death,—and yet human beings claim to have breathed, with comparative impunity, air having a temperature of 75° below zero, while others have resisted for some minutes a temperature of 325° or 113° above that of boiling water,—a range of 400°.

But this wonderful power, by which man and many of the higher mammals maintain an equable temperature in the face of fluctuations of hundreds of degrees, is not shared by innumerable hosts of living creatures. In general, it is held that the temperature depends upon the amount of fuel consumed,—but large orders of animals habitually spend half their lives in a state of passivity or torpor more or less complete, consuming little or no fuel, just when the external temperature is the most trying or hardest to resist. This is notably the case with many cold-blooded reptiles, with myriads of insects,—the fresh water and air-breathing mollusks of our climate.

Appleton's Encyclopædia alleges that in the case of some hibernating animals there is a suspension of all respiratory acts and an unchanged condition of the surrounding atmosphere.

Dr. W. G. Binney says of land snails that they withdraw themselves into their shells and "the functions of digestion, respiration and circulation being suspended and all secretions and excretions having ceased, there is no drain upon the animal," and the "mouth of the shell being hermetically sealed" the "air imprisoned in the shell is found unchanged."

There is perhaps no part of our globe where mosquitoes are more numerous and tormenting than within the Arctic Circle, and 'tis reported of Lieutenant Peary in his famous Arctic journey that he did not get too far north to find bumble-bees and butterflies, though for months at a time these frail creatures must, somewhere and somehow, in a state of complete torpor, have endured very low temperature; often from 50° to 75° below zero.

With the so-called cold-blooded animals, the temperature is said to be usually only one or two degrees above the surrounding media, and, when this sinks below freezing, they of necessity must closely follow, and must, perforce, offer less and less resistance to congealation as the vital energies "slow up."

Biologically considered, it may seem that congealation must make molecular changes in the circulating fluids destructive of their integrity,—and yet we must not permit our deduction or seemingly well founded theorizing to cheat us out of the most obvious evidence of our senses.

To satisfy himself as to how some familiar creatures do spend the winter, the writer collected, in 1893, between February 25th and March 12th, no less than 100 species of insects in different stages of development. These belonged to all the orders, and many of them were habitually in very exposed situations, as if protection from cold was of small consequence. Many, secured when the thermometer was hovering about zero, seemed frozen stiff, and would snap like dried twigs if bent abruptly; and apparently frozen ants and some small beetles and certain wood-eating larva, with the warmth of the hand and the breath, would often show signs of returning consciousness in a few minutes.

Some twenty-five experiments were made by subjecting some small Minnows, earth worms, insects, (larval and mature), to from one to five and one-half hours exposure to the rigors of a freezing mixture which was potent enough to depress the mercury from living room temperature to zero in three minutes. There seemed to be no failure to freeze all of the hundreds of creatures subjected to zero temperature for an hour or less. Some were tested and found to break like pipe stems if attempt was made to bend them, others were cut in two or sliced, and the entire visceral cavity seemed about as surely frozen or as crystaline as ever potatoes or turnips are.

The results which followed were variable. The small fish, frozen for an hour, mostly "passed that bourn from whence no traveler returns," a few gasped feebly when thawed, while one or two feebly moved about for a few minutes and then ceased to be.

A large beetle found in and under rotten wood, the "Betty-bug" of the children (*Passalus cornutus* of the books), never more than moved a leg a few times upon being thawed. *Millipedes*, *Centipedes* and Earth Worms invariably succumbed, the latter being as effectually cooked to a glutinous and almost shapeless mass as if baked. On the other hand, certain medium sized beetles and certain wood-eating larva of beetles and two or three species of large hairy caterpillars, known as "Ague Worms" and "Hedge hog Caterpillars," nearly all came through apparently uninjured after repeated exposure of from one to five and one-half hours; and some of them were still alive after two weeks, though kept in a room that would have dried apples in half the time.

The conclusions reached by these investigations are that: Insects, either in the larval or perfect stage, when in a torpid state, freeze almost as readily as inanimate objects. Second, that countless numbers freeze and thaw annually without apparent injury; and third that solidly frozen and kept below the freezing point, respiration, circulation and sensation are suspended, and all waste of substance being thus arrested, some creatures may be thus kept for months or even years, and with the return of warmth and genial conditions, resume vitality just at the point where arrested.

E. PLEAS.

Dunreith, Ind.

Mr. Pleas' paper is one of the most satisfactory that have come under the observation of the Conductors. But it seems rather to favor the proposition that no creature can be frozen "solid" and live. That they can freeze to such

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an extent as to be stiff and break when bent is well-known, but that the frost can reach the hitherto unknown material which preserves life during "dormancy" is just the point to be established. Mr. P. shows that numbers did not retain life under the freezing any more than a frozen potato or turnip would; and further that a few which did weather the frigid storm had their vitality impaired. The inference is that the freezing, in those which escaped wholly, did not reach the vital part.

SCHIZÆA PUSILLA.—One of my favorite plates in "The Flowers and Ferns of the United States" is of that rare and pretty fern, *Schizæa pusilla*. I have turned to it a good many times in the year past, and would wonder, as I looked at the odd little beauty, whether it would ever fall to my lot to collect it on its native heath. I had once seen a pressed specimen; but herbarium specimens, interesting as they are, do not quite satisfy. One wants to meet his plant in its wild home, note its native graces as it grows and see who its neighbors are. So tiny a plant as *Schizæa pusilla* is likely to give good eyes a severe test, even when the exact spot to hunt for it is known; and when only general directions are had, the task is well-nigh hopeless. At Quaker Bridge, N. J.—forever classic ground to the botanist as the place where this fern was first collected in America,—I once spent the best part of a precious holiday searching for it, but though several interesting "barrens" plants went into my press, *Schizæa* was not one of them. My gratification was great, therefore, when an opportunity was afforded me a few days ago (October 16), to accompany to Egg Harbor City, N. J., a friend who knew a station for it in that vicinity. Having only two or three hours to spare for the search, we went down from Philadelphia on the evening train, stayed over night at the hotel, and a little after sunrise were on our way in the frosty air toward the cedar swamp, near which the object of our quest grew. A walk of half a mile through a perfect blaze of leafy beauty—oaks, maples, chestnuts, birches and sumachs, all contributing to the gamut of color that ran from light yellow to dark crimson—brought us to the desired spot, a little opening among the pines and scrub oaks. The stunted trees all about, the waste of sand, the absence of life or sign of human habitation, the marks of recent fire amid the sparse vegetation, all tended to give the place an air of desolation. To me, however, being in the abiding place of a new and rare plant, there was enchantment in the air. I could realize how the hero of the old fairy tale must have felt as he stood before the castle, somewhere within which his lady love lay bound under a magic spell. The damp ground was bare in some spots, and in others, mosses, grasses and lycopodiums crept and grew, with here and there some ericaceous bush. As I walked about, bent half double, my eye was suddenly caught by what looked like a fertile frond of the little fern, but, when I stooped to pick it up, it turned out to be the dry capsule of a moss. A little later, as I was on my knees, gathering some specimens of a lycopodium new to me, I was attracted by the sight of a slender, spiral curl of green, rising hardly an eighth of an inch above the sand, and straightway I had in my hand my first *Schizæa*—a bright green cluster of twisted sterile fronds from among which arose two thread-like stalks, bearing the fertile pinnæ bunched at the top, brown with age. Then, getting down on all-fours, or lying with face close to the ground, I began to get used to the look of things down there, and as often happens in similar cases when the eye becomes "set," I shortly saw hardly anything *but* the fern,—the little spots of fertile appendages popping on my sight, one after another, as the stars break through in the darkening sky when once the night begins to fall. So our search was successfully accomplished, and by nine o'clock we were back at the station, ready for the train cityward. C. F. SAUNDERS.

Philadelphia.

NEST OF THE CHIMNEY SWIFT.—Referring to article in January number, "How does the swallow build its nest," I would say: While bird watching last spring, our attention was attracted by an occasional cracking in a dead maple tree behind us, accompanied by a whirring sound. Upon investigation, we found it was made by the chimney swifts, who flew to the tree, broke off the dead and brittle twigs and bore them away. We saw it done several times. The twigs were broken off by the bird on the wing.

CHARLES W. JENKS.

Bedford, Mass.

GENERAL GARDENING.

MEMORIES OF THE BEECH TREE.

"We sat beneath the beechen tree
Where we had sat full many a time before,
With the lost friends of days forever gone.
The place was haunted with the shadowy past;
There were familiar faces in the halls—
There were strange shadows on the winding stair;
But still the pewit, as in other years,
Was swinging careless on the delicate spray,
Whose bursting buds showed the first early green
Of April, uttering his pleasant note
Like rain-drops falling into water."

—HOWARD WORCESTER GILBERT.

THE ADVANCE OF SPRING.—A correspondent from the North, traveling southwardly, under date of February 15th, sends the following interesting notes:

"I have been in Washington some days for a recuperative winter trip, and have had several botanical rambles over in Virginia. Just the other side of the Potomac, near Arlington, I found the wild trumpet vine growing up almost every large tree near the yellow river, and, here and there, handsome Pitch Pines and quantities of young locusts. The walks were full of novelty; a large mallow by the lately-flooded river bank, a pair of evergreen herbs, which I enclose, and things appearing in such a different way from home things.

"A river reach in the bright, late afternoon sun is never to be forgotten. The pines lit to a gold green, and the yellow grass and tawny sand, with the blue river and the great monument and dome of the capitol beyond as a background. Here I came upon some Yuccas, probably escaped from an older civilization, but having all the appearance of being spontaneous and were indigenous. Here was what I took to be a *Crotalaria*, and my hands were sweet with fresh resin after I pulled some cones from the low pines. There is a large crow-roost, you know, at Arlington, and, as the day grew later, and the sun lowered and became more golden, the birds flocked in from all directions, though chiefly from the east and the south, blackened the air and filled the woods with rancorous din, bending the branches of the cedars and pines where they roosted, a mile east of the cemetery.

"At Mount Vernon, I took a short jaunt up the dry hills and barrens for the plants, and found what I take to be *Diodia teres*; and by a stream, Coral Berry and Wafer Ash. The holly through the woods is a joy to one's eyes in winter. And you remember, in Washington, how the magnolia is so great a favorite,—it is planted in every yard. Just south of Arlington, we crossed the marshes and two wild ducks flew up. It was as wild a scene as I have ever passed through, with nothing but colorless reeds and tangles of Smilax; pools of dark stagnation and cedars,—cedars everywhere, so much larger and handsomer than ours at home.

"The Ladies' Association is doing work after your own heart at Mt. Vernon, keeping the grass and trees trim and the gardens kempt, and collecting old mementos—*Washingtoniana*—in the long sacrileged rooms,—so that now, the old state of affairs are as nearly as possible re-established. I am telling you no news, I guess, but just want to send you a short souvenir of winter botany and winter sunshine in the South here, where we have no snow under foot, and the clemency and beauty of the city is a boon to those needing a change of air and scene."

VEGETABLE MORPHOLOGY.—An interesting light was thrown on the subject of vegetable morphology by the behavior of a geranium with us recently. From the centre of a truss of blossoms that were fading, a new stem shot up, and, at its top, what appeared a single large bud was developed. This continued to enlarge, but did not open. At the end of a month it was taken apart and examined, and was found to consist of no less than seventy-six colored petals and five green sepals. The receptacle on which these were inserted was about a quarter of an inch long. It seemed undecided whether to be leaves or flowers.

WILLARD N. CLUTE.

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THE ANCIENT CORN.—Referring to the note in MEEHANS' MONTHLY for February, we think possibly the corn story may refer to Missouri. There was exhibited at our annual Fruit Show, by Dr. J. T. Matson, this city, some corn grown from some old seed from the mounds of the Ozarks of Missouri. Pres. J. C. Evans, of our State Horticultural Society, and proprietor of the Olden Fruit Company, of Howell Co., is a very conservative and reliable man, and we have seen a written statement from him as to the history of this ancient corn. Should you care for same, we will secure copy; also, can send you some of the corn, if desired. The enclosed statement was published in the *Journal of Agriculture*, St. Louis, December 5, 1895.

"Attorney J. P. Dawson, of this city, a few days ago sent to this office two ears of corn which have a history of more than ordinary interest. These ears were grown the past season by Dr. Jas. T. Matson, of Louisiana, Mo., who started with thirty-two grains. He says it ripens early, with a vigorous stalk and with as high as four full ears on a stalk. One of the ears is deep red, ten inches long; the other is nine inches long, and of a peculiar yellowish, brownish color, having the appearance of having been partially roasted, although it has not been about the fire. Concerning this prehistoric corn, we get the following facts from a reliable source.

'Elder Curry, a Baptist divine, now living in Christe, Howell County, Mo., while exploring a mound near that place, found thirteen grains of corn, apparently sound, incased in a stone jar or vessel. He planted all of the thirteen grains carefully, and but one produced; and a strange incident is that but thirteen grains grew as his first produce.

They were carefully kept and planted the following year by Elder Curry, and the product was well matured. The two ears on our desk, grown by Dr. Matson, were grown from corn of that yield. President J. C. Evans, of the Missouri State Horticultural Society, who has grown some of the corn, says four-fifths of all he has raised is red, and he thinks the original grains found must have been red originally and bleached by ages.

Elder Curry, who has made a study of prehistoric history, thinks the corn he found in the mound was undoubtedly 3,000 years old. He is located in South Missouri, it is said, for the purpose of looking into ancient hieroglyphics, and is writing a history on the subject.

The above facts confirm the belief that the germinating power, or powers of reproduction, of corn may be preserved for an indefinite period if surrounded by proper conditions.'"

W. P. STARK.

Louisiana, Mo.

There is no doubt but that seeds which are protected from light, high temperature, and guarded from loss of moisture, will preserve their germinating power for a long time. It would be very desirable to know just how long such seeds would live, and it is this desire for the definite that gives the subject its chief interest. But the facts to sustain these long-period beliefs must be incontrovertible. In the present case, if thirteen grains of seed had been entombed 3,000 years, and one could survive, all would have survived without a reasonable doubt. The destructive agencies that destroyed the twelve would have been equally active on the thirteenth. The inference from these considerations would be that there is a possibility of mistake somewhere, notwithstanding the high character of the observer. The writer of this paragraph cannot claim the honorable dignities of Mr. Curry, but has been as careful as any one could be, and has often found himself at fault when it seemed impossible there could be a mistake.

POPULARITY OF CARNATIONS.—It is remarkable what a continuous hold on popular favor is possessed by the carnation. It was employed by the ancient Romans, 2,000 years ago, to make chaplets for their deities at festivals in their honor. It is botanically known as *Dianthus*, which, literally translated, is "Flower of the Gods." Florists tell us that it is one of the most popular of all used in the cut-flower trade. No flower, not even the rose, can be taken from the list of cut-flowers whose loss would be so severely felt as would the disappearance of the carnation.

CARE OF LAWNS.—Newly made lawns are liable to have noxious weeds appear. These should be carefully hand-weeded. If holes result, they should be filled with earth. The grass will soon spread in and take the places the weeds occupied. A good rolling with a hand roller, after weeding, is a good practice.

THE PRINCIPLES OF ART IN LANDSCAPE GARDENING.—Even those who have no knowledge of art can tell the difference between a garden that has been tastefully constructed and one that is wholly deficient in what would be termed the principles of art. The visiting party may not be able to explain why the one gave more pleasure than the other; but the fact, that the pleasurable feeling existed, shows that there is something solid in what is known as the principle of taste in landscape gardening. It is said by those who are experts in these arts that nearly all the beautiful results are derived from three simple elements,—the earth, sky and water. Given these three to handle as he pleases, the eminent landscape gardener can make as beautiful a picture as it is possible to realize of this earth. This is so far as the elements furnished by nature are concerned. The works of man must come in somewhere, and add what is called "life" to the picture. Hence, no matter how beautifully and tastefully a garden may be laid out according to the principles of landscape gardening, evidences of human life and human work always add to the pleasurable results of the art of the gardener. Distinct views of public buildings, churches, or any striking object connected with human life, tell the lover of gardening that he is not alone in the world.

When the poet asks in the famous song, "Who would inhabit the wide world alone?" he has a response in human sympathy from the heart of every man. It is not so much that these views of buildings give pleasure in themselves, but they indicate that there are others in the world to give us love.

Some pictures by the great masters most eloquently tell this story, though the beholder of the picture may not have the remotest idea of what it is that excites in him those pleasurable sensations. There is one which will illustrate this—a beautiful picture by Carl Weber, among the many lovely ones on exhibition in the celebrated Earles' Picture Galleries, in Philadelphia, and of which we give a miniature reproduction with this. There is in this picture a boundless breadth of sky, with a beautiful sheet of water below; while the rocks and trees and contour of the surface of the ground make in this a beautiful scene. But that there must be human life to give still more interest in the picture is evidenced by the fisherman's hut. But even this will not imply the existence of living beings. It might be a deserted cabin,—but the fish-reel shows that life is active there, and that human beings are still engaged in active operation at the point, and still further is this impressed by the little vessel sailing on the watery expanse. All combine to make a living picture in addition to the purely natural points which the landscape gardener would call essential as foundation stones.

Landscape gardeners can get many useful lessons from such pictures as these. Of course, true art is that which adapts existing circumstances to abstract rules of beauty; but where all the elements can be supplied at once, such as the artist with true genius has brought together in this picture, the true landscape gardener feels as if he were in Paradise.

PYRUS JAPONICA HEDGES.—Evergreens do not make good hedges where the roots of large trees make the earth very dry in summer time. Deciduous hedges are preferable in these cases. The *Pyrus Japonica* is a very pretty plant for a deciduous hedge. It is liable to be affected by the same white scale insect that attacks apple and pear trees. Kerosene emulsion, forced in among the branches by a good spraying machine, is effective in keeping them down.

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TREES FOR PUBLIC STREETS.—Prof. Chas. E. Bessey has a good word in *Garden and Forest* for the Box Elder as a tree for generally useful purposes on the plains. It is not less true of it that it might be rendered of much more service in the East as a shade tree on public streets than it is at present. The great mistake in almost all selections for street trees in the older portion of our country is that they look to rapid growth alone. The Conductors of this magazine know of streets in which sidewalks are not more than 6 to 8 feet in width, and yet lofty forest trees, which within a few years become many feet in diameter, are employed as shade trees, getting so large that finally there is not room for a person with an umbrella to pass between them and the building line. These forest trees usually grow rapidly, and it is forgotten that this very rapidity in time becomes a fault. They not only get too thick in the trunk, but entirely too tall for any useful purpose. There is great temptation to employ the tree butcher to head them off. This is done in hope that they will branch lower, and give the grateful shade for which they were originally employed. Experience shows that this is all wrong. Trees headed off in this fashion always rot in the centre, and a very few years after such treatment they are only fit for fire wood. Now there are a number of trees which grow very rapidly for a few years but soon come to a standstill and make nice spreading heads. Good street trees should be sought for in this list. The Box Elder, or as people call it in the East, the Ash-leaf Maple, is one of them. It rarely reaches 40 feet in height and has an early tendency to spread horizontally. The Norway Maple is another which has this spreading habit. The Catalpa may also be named. There are also some species of oak which grow rapidly and yet do not reach lofty proportions. And there are trees of recent introduction which seem to be of this character,—some of them belonging to the mulberry family. The old Paper Mulberry, which has now almost disappeared on account of its annoying habit of throwing numerous sprouts or "suckers" from the roots, is yet a remarkably good tree, for the other reason cited. It belongs to the genus *Broussonetia*. Another Japanese species has been introduced under the name of *B. Kæmpferi*, but this seems to have suckering proclivities. The *Hovenia dulcis* appears also to incline to rapid growth when young, and makes a spreading and lofty head. Even the *Kœlreuteria* would make an excellent tree for a narrow street when an entirely low and spreading habit with rapid growth in its younger stage is desired. A number of these are well worth trial.

RAISING TREE SEEDS.—A Mobile, Alabama, correspondent says:—"I find myself much in want of information on the vitality of tree seeds and the time required for their sprouting after being placed under ground. I readily raised plants of *Taxodium distichum* a year old, finding them to sprout a month or so after sowing. With the White Cedar, *Chamæcyparis thuyoides*, and the Red Cedar, *Juniperus Virginiana*, I never had such success."

There is no rule in regard to the germination of tree seeds. A quantity may be gathered from the same tree, be all preserved alike, and sown at the same time. Most of them may sprout the following spring; but a large number of plants will appear the following year, and often many will be found coming up the third year. No explanation has been given of these vagaries. A remarkable feature in tree-seed growing is, that most seeds have a period in spring in which they seem to love to sprout. If for any reason they do not germinate within that period, nothing will induce them to grow till the following spring. They seem to have intelligence that they cannot mature the young plant, unless they start in good time during the spring season. Seeds that have somewhat hard coatings are difficult to get to grow the same season when sown in spring. Such seeds cannot usually be obtained till after the ground has frozen up in autumn. In this case the method is to save the seeds till the growing season in spring has passed, and then mix them with earth and sow the next fall or spring. This is termed, in the language of the seed growers, putting the seeds in the rot heap. Such seeds as holly, hawthorn, and one of those inquired about by our correspondent, the Red Cedar, *Juniperus Virginiana*, are of this class. Most coniferous seeds grow easily the same season of sowing, though the harder-shelled ones, such as the Deciduous Cypress, *Taxodium distichum*, will have a few lie over till the second year.

REPOTTING PLANTS.—The amateur gardener is often at great trouble to repot plants. A few simple directions will help materially to lighten his labors. A beautiful work for amateurs has recently been published in Berlin by Max Hesdorffer, one of the editors of *Natur und Haus*, entitled "Handbuch der Practischen Zimmergartnerei," from which we take the illustrations for this paragraph.

Fig. 1.

Fig 1 represents a pot-bound aralia, which needs more room, or the leaves will soon get yellow and sickly. The plant is inverted, and, if it has been watered a little time previously, the plant will fall out of the pot at a slight shake. But at times, the roots adhere so tightly, that a slight tap of the edge of the pot against the potting table will be required before the plant will fall. Fig. 2 shows the next operation, with a dracæna in hand. In our American practice, the empty pot would be placed in an upright position, instead of on its side, as in this picture, to save it from being broken by rolling off. They would be placed upright, so that other pots could be placed in them, ready to be carried away. This can be done with American pots, as they are so constructed, that a phlange prevents undue pressure on the lower pots. European flower pots would have the lower ones cracked by the outward pressure of the upper pots on the one below.

Fig 2.

But to return to the potting process, a pointed stick is used to press apart the mass of roots, which have coiled inwardly by the confinement heretofore. The illustration represents a round stick, but in America a flat one is preferred. Fig. 3 shows the re-potting process, this time with a *Kentia* palm. The earth used to fill in the space between the smaller ball and the larger pot is preferred to be as dry as possible. It is then rammed in as tight as possible, with a flat stick. This, by the way, is why the flat is preferred to the round stick, as previously noted, that the same one will answer both operations. Wet earth will not do, because it drives out all the air when rammed in tightly,—but, when dry, the more it is rammed, the more it pulverizes, and the more minute air spaces it contains, which is considered the perfection of soil treatment.

CLASSIFICATION OF CHRYSANTHEMUMS.—In the great exhibition, which is to be held at Ghent, in Belgium, between the 15th and 17th of November next, under the auspices of Count de Kerchove, the crysanthemums are to be exhibited in separate classes as follows: Fifty flowers of the Japan race, which may be incurved, reflexed or anemone-like; 75 flowers of any class; 30 flowers of Japan varieties or their hybrids; 30 flowers anemone-like, which may be incurved or reflexed; 20 named kinds on tall stems; 20 flowers of varieties introduced between 1895 and 1896; collection remarkable for size of flowers; collection of three boquets formed of chrysanthemum flowers; a vase of flowers with chrysanthemums for the chief ornament. We hope Americans will compete there.

Fig. 3.

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TREES FOR PUBLIC STREETS.—Prof. Chas. E. Bessey has a good word in *Garden and Forest* for the Box Elder as a tree for generally useful purposes on the plains. It is not less true of it that it might be rendered of much more service in the East as a shade tree on public streets than it is at present. The great mistake in almost all selections for street trees in the older portion of our country is that they look to rapid growth alone. The Conductors of this magazine know of streets in which sidewalks are not more than 6 to 8 feet in width, and yet lofty forest trees, which within a few years become many feet in diameter, are employed as shade trees, getting so large that finally there is not room for a person with an umbrella to pass between them and the building line. These forest trees usually grow rapidly, and it is forgotten that this very rapidity in time becomes a fault. They not only get too thick in the trunk, but entirely too tall for any useful purpose. There is great temptation to employ the tree butcher to head them off. This is done in hope that they will branch lower, and give the grateful shade for which they were originally employed. Experience shows that this is all wrong. Trees headed off in this fashion always rot in the centre, and a very few years after such treatment they are only fit for fire wood. Now there are a number of trees which grow very rapidly for a few years but soon come to a standstill and make nice spreading heads. Good street trees should be sought for in this list. The Box Elder, or as people call it in the East, the Ash-leaf Maple, is one of them. It rarely reaches 40 feet in height and has an early tendency to spread horizontally. The Norway Maple is another which has this spreading habit. The Catalpa may also be named. There are also some species of oak which grow rapidly and yet do not reach lofty proportions. And there are trees of recent introduction which seem to be of this character,—some of them belonging to the mulberry family. The old Paper Mulberry, which has now almost disappeared on account of its annoying habit of throwing numerous sprouts or "suckers" from the roots, is yet a remarkably good tree, for the other reason cited. It belongs to the genus *Broussonetia*. Another Japanese species has been introduced under the name of *B. Kæmpferi*, but this seems to have suckering proclivities. The *Hovenia dulcis* appears also to incline to rapid growth when young, and makes a spreading and lofty head. Even the *Kœlreuteria* would make an excellent tree for a narrow street when an entirely low and spreading habit with rapid growth in its younger stage is desired. A number of these are well worth trial.

RAISING TREE SEEDS.—A Mobile, Alabama, correspondent says:—"I find myself much in want of information on the vitality of tree seeds and the time required for their sprouting after being placed under ground. I readily raised plants of *Taxodium distichum* a year old, finding them to sprout a month or so after sowing. With the White Cedar, *Chamæcyparis thuyoides*, and the Red Cedar, *Juniperus Virginiana*, I never had such success."

There is no rule in regard to the germination of tree seeds. A quantity may be gathered from the same tree, be all preserved alike, and sown at the same time. Most of them may sprout the following spring; but a large number of plants will appear the following year, and often many will be found coming up the third year. No explanation has been given of these vagaries. A remarkable feature in tree-seed growing is, that most seeds have a period in spring in which they seem to love to sprout. If for any reason they do not germinate within that period, nothing will induce them to grow till the following spring. They seem to have intelligence that they cannot mature the young plant, unless they start in good time during the spring season. Seeds that have somewhat hard coatings are difficult to get to grow the same season when sown in spring. Such seeds cannot usually be obtained till after the ground has frozen up in autumn. In this case the method is to save the seeds till the growing season in spring has passed, and then mix them with earth and sow the next fall or spring. This is termed, in the language of the seed growers, putting the seeds in the rot heap. Such seeds as holly, hawthorn, and one of those inquired about by our correspondent, the Red Cedar, *Juniperus Virginiana*, are of this class. Most coniferous seeds grow easily the same season of sowing, though the harder-shelled ones, such as the Deciduous Cypress, *Taxodium distichum*, will have a few lie over till the second year.

REPOTTING PLANTS.—The amateur gardener is often at great trouble to repot plants. A few simple directions will help materially to lighten his labors. A beautiful work for amateurs has recently been published in Berlin by Max Hesdorffer, one of the editors of *Natur und Haus*, entitled "Handbuch der Practischen Zimmergartnerei," from which we take the illustrations for this paragraph.

Fig. 1.

Fig 1 represents a pot-bound aralia, which needs more room, or the leaves will soon get yellow and sickly. The plant is inverted, and, if it has been watered a little time previously, the plant will fall out of the pot at a slight shake. But at times, the roots adhere so tightly, that a slight tap of the edge of the pot against the potting table will be required before the plant will fall. Fig. 2 shows the next operation, with a dracæna in hand. In our American practice, the empty pot would be placed in an upright position, instead of on its side, as in this picture, to save it from being broken by rolling off. They would be placed upright, so that other pots could be placed in them, ready to be carried away. This can be done with American pots, as they are so constructed, that a phlange prevents undue pressure on the lower pots. European flower pots would have the lower ones cracked by the outward pressure of the upper pots on the one below.

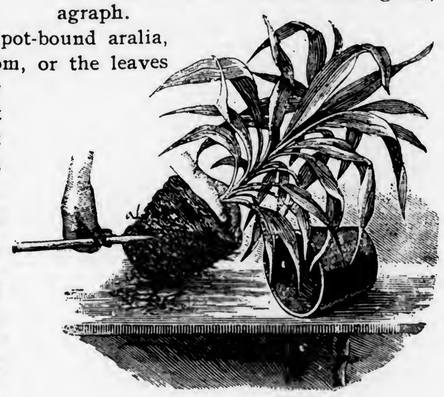

Fig 2.

But to return to the potting process, a pointed stick is used to press apart the mass of roots, which have coiled inwardly by the confinement heretofore. The illustration represents a round stick, but in America a flat one is preferred. Fig. 3 shows the re-potting process, this time with a *Kentia* palm. The earth used to fill in the space between the smaller ball and the larger pot is preferred to be as dry as possible. It is then rammed in as tight as possible, with a flat stick. This, by the way, is why the flat is preferred to the round stick, as previously noted, that the same one will answer both operations. Wet earth will not do, because it drives out all the air when rammed in tightly,—but, when dry, the more it is rammed, the more it pulverizes, and the more minute air spaces it contains, which is considered the perfection of soil treatment.

CLASSIFICATION OF CHRYSANTHEMUMS.—In the great exhibition, which is to be held at Ghent, in Belgium, between the 15th and 17th of November next, under the auspices of Count de Kerchove, the crysanthemums are to be exhibited in separate classes as follows: Fifty flowers of the Japan race, which may be incurved, reflexed or anemone-like; 75 flowers of any class; 30 flowers of Japan varieties or their hybrids; 30 flowers anemone-like, which may be incurved or reflexed; 20 named kinds on tall stems; 20 flowers of varieties introduced between 1895 and 1896; collection remarkable for size of flowers; collection of three boquets formed of chrysanthemum flowers; a vase of flowers with chrysanthemums for the chief ornament. We hope Americans will compete there.

Fig. 3.

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INTENTIONAL SECOND EXPOSURE

FOREST MANAGEMENT AND FOREST FIRES.—This magazine has pointed out that there will never be absolute security against forest fires as long as the woods are filled with inflammable matter in the shape of dead and dry underbrush. Though millions of dollars are spent on forest wardens, and tons of laws inflicting penalties are posted, as long as there is a gunpowder-like mass of material ready to go off with a flash, disastrous forest fires will ever be. A small supply of dead twigs, and of gathered leaves among living underbrush, will do no harm,--a fire flowing along material such as that will not hurt the forest trees. The writer knows of a wood such as this, which is annually fired by locomotives, without the slightest injury to the oak, hickory and Red Maple of which the forest is composed. In order to illustrate the point made, permission has been obtained of Mr. Gifford, of May's Landing, New Jersey, to reproduce from *The Forester*, which he so ably edits, a sketch of a natural White Pine forest in that State, see page 65. It will be seen from this how impossible it is that a wood of that character should take fire to result disastrously. The planting of new forests is much obstructed through the fear that, after a quarter of a century of patient waiting for timber, the planter might find the forest only fuel for the flames,—but if kept clear, as a newly-planted forest should be, for a few years, of an accumulation of dead material, there ought to be no risk that any insurance company would not readily assume.

IMPROVEMENT IN THE SHELLBARK.—I send you by this mail samples of Shellbark Hickory nuts. I think them a little better in appearance and in fact than any that have ever come to my notice. I know nothing of the history of the trees, as they grow on a farm which I bought last summer. The one bearing the nuts with the very thin shell and uneven surface grows near the foot of a steep hillside, and just below a spring, and has a large excess of "deaf" nuts, perhaps three fourths of the crop. It is ten inches in diameter at the base and about forty feet high and was very full of nuts.

The smoother shelled nut is from a small tree. I want your opinion as to the value of the find, and if they are of a choice variety, what would be the best method of propagating them. Will a tree grown from a nut bear fruit true to its kind, or would it just as likely be something inferior?

Is it not likely that the location of this (the larger) tree has a great deal to do with the fact of the fruit being so defective. The nuts all grew to full size, with beautiful white, wrinkled shells, but fell early, and fully four out of five were "deaf."

If I was sure I could get that nut to bear true to seed, or by grafting, or budding, I would plant it largely. Will you kindly give me your opinion, and oblige,

E. J. BAIRD, D. D. S.

Lock Haven, Pa.

The nuts were superior, as Dr. Baird describes. The hickory like all other fruit trees, does not reproduce itself exactly. Some of the seedlings might be better or worse than its parent. Good varieties can only be surely secured by grafting them on seedling stocks. It is rather surprising that while in the South much attention is being given to selecting and grafting improved forms of the Pecan Hickory, nothing is being done in the North with the improved Shellbark Hickories. Dr. Baird will render good service by starting so good an example.

CULTURE OF CHRYSANTHEMUMS. — Most growers like to have bushy plants. Pinching out the points of the strong growing shoots effects this. The weak shoots should not be stopped This must be done early in the growing season. Late pinching induces small flowers. Large flowers are obtained by pinching out the weaker buds. The whole power of the plant is then spent on the one or two buds left. Healthy leaves tend to help form large flowers. Any appearance of leaf disease should be at once checked. The perfection of Chrysanthemum growing is to keep the old leaves healthy as long as possible.

NEW OR RARE PLANTS.

DAPHNE CNEORUM. — The pretty *Daphne Cneorum* will often bloom profusely in the autumn as well as in early summer. Its sweet-scented, rosy flowers make it always welcome. Even the little evergreen bush which bears them is ornamental. It is a plant well suited to sandy soil, or soil that is full of stones or gravel. It dislikes heavy clay or stiff earth of any kind. A friend, who has a rather poor soil to deal with, first sets the plant in a very shallow manner, and then puts a frame of thin boards three or four inches deep around the plant. This is filled in with sand. The branches root in the sand, and the plant grows freely in it.

VINCA HERBACEA.—A very old, but very rare herbaceous perennial, is *Vinca herbacea*, a native of Hungary, and therefore perfectly hardy. The common Evergreen Periwinkle, *Vinca minor*, is well known, if not under its botanical name, at least under its common one of Hardy Myrtle. The herbaceous one, as its name implies, dies completely back in the fall, but in the spring starts again, and is soon covered with a mass of bright blue flowers, which renders it quite a showy ornament in the garden. It is one of the most satisfactory of perennial plants.

NEW SWEET PEAS.—Great strides have been made in the past few years in the improvement of the sweet pea. We have this year a further proof of this in the offering of a double flowered form. The introducers, Peter Henderson & Co., state that "they will not all come double, but, if the plants are grown strong and luxuriant, they usually produce from 20 to 40 per cent. of double blossoms."

Further development in the advancement of this flower is presented by W. Atlee Burpee & Co., who are introducing a dwarf white sort,—"Cupid." They claim that it has "entirely lost the habit of a vine and makes a low tuft of short branches which hug the ground, showing no tendency either to trail or climb." This is certainly a most desirable trait, as it does away with the use of "brush," which is always an unsightly object in a well-kept garden.

Another valuable sort, introduced by D. M. Ferry & Co., is the "Extra Early Blanche Ferry." They claim for it that it will come into bloom fully ten days before the old sorts. This may be the case when they are grown in the garden, but when forced under glass in the winter they will bloom at least six weeks earlier. This the editors can testify to, having forced both sorts—flowers opening on the "Extra Early" by February 1st.

FRUITS AND VEGETABLES.

GRAPE CULTURE IN VIRGINIA.—Prof. S. B. Heiges, the Pomologist of the U. S. Department of Agriculture, made an extended trip among the fruit growers of the south last autumn and makes the following notes in regard to grape culture in Virginia:

"At Charlottesville many of the vineyards of that noted section were observed. William Kopoff has 75 acres in vineyards, in which grow Norton, Ives, Concord, Riesling and Elvira. He sprays very early and his vineyards are not troubled with rot; he formerly sprayed five times, but now sprays only twice a season. He fertilizes with raw bone, as potash does not do as well, and none who have tried it see benefit from its use. His vineyard has yielded 8,000 pounds per acre. He converts his grapes into wine and makes from 20,000 to 60,000 gallons per year, which he sells to private parties from Maine to Texas. He also distills about 400 gallons of brandy per annum.

Mr. Becket has 100 acres largely devoted to grapes. His Delawares bring him 35 to 85 and Concords 30 to 60 cents per 5-pound basket; Salems 45 cents and Marthas 35 to 60 cents per 4-pound basket.

The Monticello Wine Company, largely engaged in the making of wines and the distillation of brandy, affords a convenient market for the grapes of this region. The resources of this section in general fruit culture are varied and of great extent."

BALDWIN AND RHODE ISLAND GREENING APPLES.—For all the competition from new and improved varieties of apples, the Baldwin and Greening apples form the bulk of what are sold in the Eastern Markets during spring. Considering the long time these two varieties have been under cultivation, it must be conceded that they do not aid very much the notion that varieties wear out.

QUALITIES OF A MARKET APPLE.—Putting the question to a large dealer why apples not more than second rate were more popular with market men than kinds of better quality, which would command a larger price, he remarked that the kind that did not decay rapidly had the most profit in it.

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BIG APPLES.—The *California Fruit Grower* has the following which explains itself:—

"It is of but little use for Eastern men to say they have produced the biggest or best of apples, or in fact of any other kind of fruit. The mighty West always comes in with something bigger or better. Here is a case in point from the *Rural Northwest*, of Portland Oregon:—

'The *California Fruit Grower* says that MEEHANS' MONTHLY for November presents a cut of a Winter Rambo, or Rambour, apple measuring 5⅜ inches in diameter and announces it the largest apple known. The *California Fruit Grower* wants to know what Oregon apple growers have to say on this subject. It is to be said that the apple referred to is not the largest grown, though doubtless it is the largest known to MEEHANS' MONTHLY. Both Oregon and Washington have grown apples of much larger size. Ex-Senator Ford, of Milton, Oregon, raised in 1876 a Gloria Mundi Apple which weighed 46 ounces. The apple was exhibited in both Oregon and Washington and then sent East for exhibition. An apple of the same variety which closely follows it in size was grown in Clarke County, Washington. This apple was exhibited in Portland and a life-size reproduction of the same was made in wax which remains to prove that a much larger apple than the one described in MEEHANS' MONTHLY has been grown. There is also pretty good authority for the claim that a Gloria Mundi Apple was once grown in Yamhill County, Oregon, which weighed 5½ pounds. A few weeks ago the *Herald*, of Coquille City, Oregon, reported that Mr. Figg, who resides near that place, has raised apples this year which measured 5½ inches in diameter. Possibly the measuring may not have been so accurate as that done by MEEHANS' MONTHLY, but there cannot have been much difference in size. The *California Fruit Grower* failed to state what the apple described in MEEHANS' MONTHLY weighed, but a Rambo Apple 5⅜ inches in diameter ought to weigh about 35 ounces.'"

To which, we have only to say, that the size and weight of an apple are by no means co-relative. Among apples in general cultivation there are few that will equal the Alexander in size,—but many kinds with much smaller fruit will outweigh them. Every one is, however, prepared to look to the Pacific States for leadership in large fruits.

THE LADY THOMPSON STRAWBERRY.—Possibly the largest strawberry now in cultivation is the Lady Thompson. It is depressed globose in form, and has been raised seven and a half inches in circumference. Mr. O. W. Blacknall, who tests strawberries on a large scale, at Kittrell, North Carolina, says of it:

"This is the new North Carolina variety which, by the astonishing prices the berries brought on the northern markets, created such a stir among fruit growers. Owing to its large size and strong points as a shipping berry, it brought from 30 to 40 cents a quart, while other kinds were selling at less than half that price. The fortunate man who got it first grew 10,000 quarts an acre, and cleared $13,000 on it in one season. I have not yet fruited it, except on young plants, but I have taken much pains to correspond with disinterested men who have, and they consider it to have a distinct place of its own as a great market berry. Of 100 or more varieties on my place, it is the most independent of drought and the quickest and fastest grower of all."

THE CULTURE OF THE ONION.—In many parts of the world, the onion is sown in early spring, and manages to get to as large a size as the grower desires the same season. This is especially true of gardening in Spain, where the onion is the most popular of all vegetables. In other countries, especially in many parts of the Eastern States of this country, the onion is sown in the usual spring time of seed planting; but mature when they reach the size of marbles. These small bulbs are called onion sets, and they have to be planted the next season in order to reach their full size. It is now stated that if the onions are sown in hot-beds, under glass, about the time that early spring radishes are sown, and then moved to the open ground, they will reach their full size that season. It would seem as if this would be a much more economical way than the old fashioned plan, which requires two years or over. It is well worth the attention of progressive gardeners. In onion culture it may be remarked, loose soil is to be avoided. The best results follow where the earth is firmly pressed.

GRAPE CULTURE IN SUMMER TIME.—Almost all the treatises on the practical cultivation of the grape are intended for large vineyards, where the grape is cultivated for market purposes alone. The amateur gardener who has but a few dozen grape vines to care for can get very little profit from these rules. For the benefit of the amateur, we may say that the best time for pruning his grapes will be the spring and summer months. He should have a clear idea as to the number of branches, and which ones he needs to leave grow for fruiting the following season; and, soon after growth has commenced, the weaker shoots, that he does not need for fruiting the following season, should be taken out. All the vital power of the plants will then go into the branches that are left. They will be strong and healthy and bear fine grapes the following season. Another point to be attended to is, that in the limited room of the amateur's garden it is desirable to keep the fruiting branches as low to the ground as possible, and every effort should be made to make them strong. In the summer pruning, or rather "pinching out," of these branches, it will be found that the upper shoots are the strongest and the lower ones the weaker. If it is found desirable to have the branches low towards the ground, the upper branches, although strong, should be pinched back. This will throw the strength of the plant into the weaker branches, and make them as strong as if they pushed out from the upper portions of the plant. It is impossible to teach this in the few words of a paragraph. Much can be learned from actual trials, and if the amateur grower with little experience in grape growing, and with this paragraph before him, will experiment with a single vine for one year, he will learn more from actual observation than he could by studying a whole book on grape culture for a week.

PRODUCTIVE VARIETIES.—There is much difference of opinion as to the reason why some varieties of fruit are more prolific than others; and a reason has been suggested in connection with the strength or weakness of the floral organs. The U. S. Department of Agriculture gives a list of some apples and pears, with their characters in this respect:

Apples.—*Varieties more or less self-sterile.* Bellfleur, Chenango, Gravenstein, King, Spy, Norton, Melon, Primate, Rambo, Red Astrachan, Roxbury Russet. Spitzenberg, Talman Sweet.

Varieties generally self-fertile.—Baldwin, Codlin, Greening.

Pears.—*Varieties more or less self-sterile.* Anjou, Bartlett, Boussock, Clairgeau, Clapp, Columbia, Easter, Gray Doyenne, Howell, Jones, Lawrence, Louise Bonne, Mount Vernon, Sheldon, Souvenir du Congres, Superfin, Colonel Wilder, Winter Nelis.

Varieties mostly self-fertile. Angouleme, Bosc, Buffum, Diel, Flemish Beauty, Kieffer, Le Conte, Manning's Elizabeth, Seckel, Tyson, White Doyenne.

The subject is one of great interest to fruit growers, and deserves to be examined more carefully. A few experiments are not enough to establish such a general principle. The Conductors knew of a Red Astrachan tree, isolated far from other apple trees, that was anything but "more or less self-sterile." We have regarded sterility as often due to the relative maturity of stamens and pistils in the same tree. Some seasons the stamens will mature and scatter the pollen long before the pistil is in a condition to profit by it. The same tree, in other seasons, will mature the pistils in advance of the stamens. It is believed that this point has been wholly overlooked in the government experiments. But it is one of great importance in a final settlement of the question. This being true, it would follow that a tree, self-sterile in one locality or one season, would be abundantly productive in another.

SHIPPING GRAPES TO THE OLD WORLD.—Grapes can be safely transported across the Continent and enter any successful competition in the Grape Market of the East; but for some reason or other it has not been found possible to send them across the Atlantic to enter into English markets. The past year, a determined effort was made to ship to England; but, notwithstanding the advancement of what might be termed Progressive Shipping Knowledge, failure resulted. There ought surely to be some method by which we could carry these lighter fruits to the Old World without loss, seeing how much we have done to transport them safely to even the remotest portions of our wide domain.

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BIOGRAPHY AND LITERATURE.

A FLOWER SERMON.

Everywhere about us are they glowing,
Some like stars, to tell us Spring is born;
Others, their blue eyes with tears o'er flowing,
Stand like Ruth amid the golden corn;

Not alone in Spring's armorial bearing,
And in Summer's green-emblazoned field,
But in arms of brave old Autumn's wearing,
In the centre of his brazen shield.

—LONGFELLOW.

WORDSWORTH.—The reader versed in English literature doubtless knows that "Wadsworth," the author of the beautiful lines on the daffodil at page 29, should have been printed Wordsworth.

HISTORY OF KING COTTON.—A paper on the history of cotton, by Mrs. Elizabeth L. H. Willis, of Charleston, read at the Womans' Congress of the recent exposition in Atlanta, appeared in the Charleston *News* of October 16th. It is one of the most intelligent and valuable succinct accounts of this important article that has ever appeared, and deserves publication in some more permanent form than the column of a daily newspaper. If Mrs. Willis could have it prepared with copious illustrations, surely some bookseller would find it profitable to publish it. Of special interest to the writer of this notice is the information given in regard to the progress the South is making in the manufacture of its own cotton. It brings forcibly to mind an incident in the writer's life. At the conclusion of the war, he was asked by a prominent leader in the affairs of the nation to make a quiet visit to the South and report on the prospects for a revival of business. "We know all about its politics," he remarked, "but what to do to revive business there, is the problem." It was found on that trip, that no sense could be found among the political leaders. Those who had fought in the war were more reasonable. A meeting was arranged with some of the Confederate officers, and the business situation discussed in the Hotel St. Charles, at New Orleans. These gentlemen insisted that the way to revive southern industries was for the North to send its capital South to invest in cotton mills, and in the utilization of southern products generally. It was apparently a revelation to these gentlemen to learn, for the first time, that even in the North capital never originated anything. Industry founded the enterprise, and capital simply came to its aid. It was finally agreed that every effort should be made to induce southern men to start industrial enterprises; and then to induce northern newspapers to encourage capital to aid them, when it was evident that any southern enterprise was a success. The cotton mills of Canton soon followed this advice. Mrs. Willis shows in her paper that to-day there are 425 cotton mills, running 3,023,000 spindles, in successful operation in the southern states; while the total machinery of the North has not diminished, being 13,700,000 spindles in 1895, against 12,825,000 in 1890. It is a great pleasure to note these evidences of progress.

While reading Mrs. Willis' suggestive paper the origin of the word muslin may be referred to. Mrs. Willis repeats the dictionary derivation of "from Mosul, an early shipping port for this article." It has always seemed that this explanation is related to Sydney Smith's effort to show that gherkin, a small cucumber, is derived from jacket, the short garment. Linen was only known, and the fine article from cotton came subsequently. Supposing some very fine article from another plant, wholly new to us, were to be received by us from Liverpool, we might find it in our marts as Liverpool cotton, or Liverpool Lin (flax), but scarcely "Liverpool" alone. It has always seemed that Mosul linen, or Mosul lin, was a more reasonable derivation of muslin than the name of the port, Mosul, alone.

DR. H. H. RUSBY.—This famous botanical collector, who has done so much for our knowledge of southern botany, has started to explore the Orinoco region.

M. S. BEBB.—The year 1895 will be memorable for the number of eminent botanists who have passed away. Michael S. Bebb died on the 5th of December, in his 62d year. He was born on the 22d of December, 1833, at Hamilton, Ohio; his father was governor of Ohio. In the knowledge of the difficult family of willows, Mr. Bebb was the leading authority.

THE TRUTHS OF HISTORY.—Natural history is not the only history that passes along doubtful stories and then builds beautiful theories on them as absolute facts. A curious book, "The love affairs of a Bibliomaniac," from the pen of Eugene Field, has just appeared. A sort of garden rhyme attracted closer attention than it might have done. Among other Munchausenist tales, the following caught the eye in regard to the notable Greek scholar, Dr. Porson, who died in the beginning of the present century:—

"This human monument of learning happened to be traveling in the same coach with a coxcomb, who sought to air his pretended learning by quotations from the ancients. At last old Porson asked:

"'Pri'thee, sir, whence comes that quotation?'

"'From Sophocles,' quoth the vain fellow.

"'Be so kind as to find it for me?' asked Porson, producing a copy of Sophocles from his pocket.

"Then the coxcomb, not at all abashed, said that he meant not Sophocles, but Euripides. Whereupon Porson drew from another pocket a copy of Euripides, and challenged the upstart to find the quotation in question. Full of confusion, the fellow thrust his head out of the window of the coach and cried to the driver:

"'In heaven's name, put me down at once; for there is an old gentleman in here that hath the whole Bodleian Library in his pocket!'"

In the first place the "pri'thee" was not in use among cultivated people at that period. It is to be regretted that the "coxcomb" was so readily "confused." Had he kept on the great man would no doubt have drawn from his capacious breeches pockets Æschylus, which he himself had edited, and a whole grist of Greek works ending with the Anabasis of Zenophon, all dragged around in a stage coach! How comes such a story to become a part of truthful history? He is said by his biographer to have been a man remarkable for probity and a love of truth,—but as he was a man who loved to get gloriously drunk at times, he probably told the story, as a joke, when he was on a "spree."

But for the garden poem. It is a curious imagination that could detect the odor of so many good flowers in a lot of musty, ship-worn old books,—but the fancies are in some respect pretty, nevertheless.

"THE SMELL OF MY OLD, OLD BOOKS."

"My garden aboundeth in pleasant nooks
And fragrance is over it all;
For sweet is the smell of my old, old books
In their places against the wall.

Here is a folio that's grim with age
And yellow and green with mold;
There's the breath of the sea on every page
And the hint of a stanch ship's hold.

And here is a treasure from France la belle
Exhaleth a faint perfume
Of wedded lily and asphodel
In a garden of song abloom.

And this wee little book of Puritan mien
And rude, conspicuous print
Hath the Yankee flavor of wintergreen,
Or, may be, of peppermint.

In Walton the brooks a-babbling tell
Where the cherry daisy grows,
And where in meadow or woodland dwell
The buttercup and the rose.

But best beloved of books, I ween,
Are those which one perceives
Are hallowed by ashes dropped between
The yellow, well-thumbed leaves.

For it's here a laugh and it's there a tear,
Till the treasured book is read;
And the ashes betwixt the pages here
Tell us of one long dead.

But the gracious presence reappears
As we read the book again,
And the fragrance of precious, distant years
Filleth the hearts of men.

Come, pluck with me in my garden nooks
The posies that bloom for all;
Oh, sweet is the smell of my old, old books
In their places against the wall!"

THE WILD FLOWERS OF CONNECTICUT.—Mr. James N. Bishop, of Plainville, Conn., is preparing a new catalogue of the native flowers and wild plants of Connecticut, and would be glad of any notes in relation thereto. We never knew, till preparing our wild flower chapters, how valuable local Floras are. Though so unpretentious, they are of broad value.

PHOTOCOPY OF ORIGINAL

GENERAL NOTES.

SUPERINTENDENT OF SCHENLEY PARK.—Mr. Wm. Falconer, the well-known gardener to Mr. Chas. A. Dana, and the esteemed editor of *Gardening*, has been selected superintendent of the beautiful Schenley Park at Pittsburgh, to the satisfaction of every lover of park gardening in America. The idea is prevalent, that politics enter so largely into public work, that it is difficult to get the right men into the right places. The fact that so able a man as the late Mr. Bennett, and now Mr. Falconer, can be given such a position speaks for itself.

SPIRÆA ASTILBOIDES FLORIBUNDA.—Mr. K. J. Kuyk, of Hillegom, Holland, writes that the photograph from which we made the cut of *Astilbe Japonica grandiflora*, at p. 174 in our last vol., was sent to us for our information only, and not for use, and that it appears in his catalogue as *Spiræa Astilboides floribunda*. We have always taken it for granted that we can make cuts from photographs sent to us, and can only regret that there was any misunderstanding on this occasion. And further, we were under the impression that if there was anything on the photograph to indicate private ownership it was overlooked. At any rate, we supposed that it was the same as the one in the trade, being distributed under the name referred to in the article. We are glad of the chance even at this late date, to do full justice to Mr. Kuyk, who is one of the most enterprising of Holland's nurserymen.

DEAN HOLE'S IDEA OF HUMOR.—It has been the proud boast of flower-lovers that the cultivation of a love of gardening tends to broaden human sympathies. Dean or Canon Hole, of England, has a great name in connection with rose culture, and he is in some sort a leader in some branches of gardening. For this reputation he was feasted and toasted during a tour through our country last year in a manner seldom accorded to visiting horticulturists from the Old World. He has had to write a book about us, of course. In this he quotes with unction many specimens of what he regards as typical American humor. When he was in Cincinnati, the thing that most impressed him was the following bit of doggerel, which he heard recited in that city:

"Little Willie from his mirror
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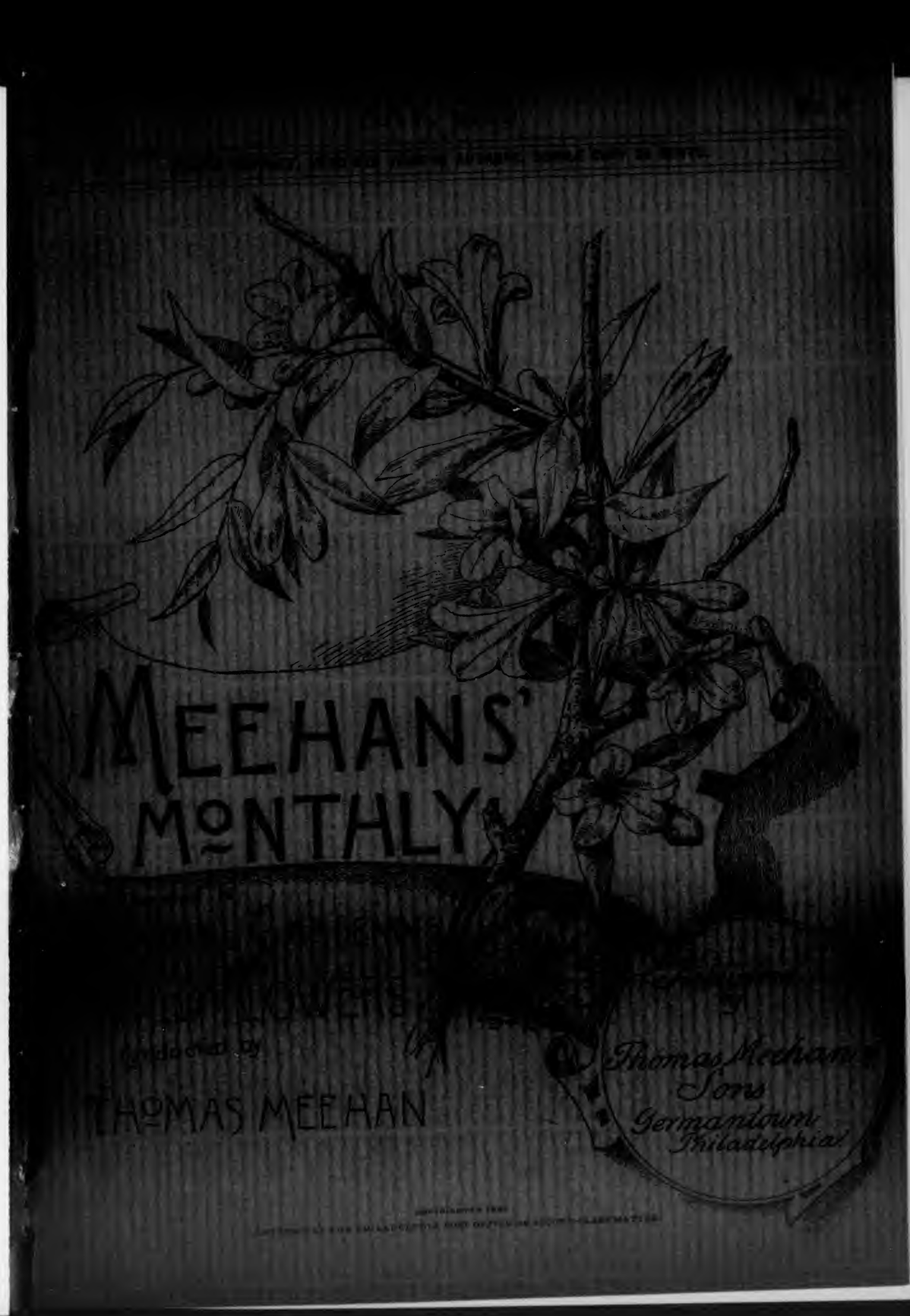
At the funeral Willie's mother
Smartly said to Mrs. Brown:
'Twas a chilly day for William,
When the mercury went down.'"

It is a matter of surprise that a gentleman of his cloth could have ever gotten into company where such heartless rubbish entered into the festivities of the evening; and still more surprising that he should have so much enjoyed it as to make a copy of it for his "book." If Canon Hole is to be taken as a specimen of floral-cultured humanity, the less we boast of the civilizing influences of our craft, the better. Fortunately we all know that such an exhibition of callous sympathy is exceptional in our country, however it may be enjoyed in the Old World.

PROF. WM. SAUNDERS.—Few names are more familiar among intelligent horticulturists than that of Prof. Wm. Saunders, of London, Ontario,—a reputation equally gained among botanists and entomologists. He is a native of England, having been born in Devonshire, but settled in Canada in 1848. In 1855, he started in business as a manufacturing chemist. When the Western University was established at London he was chosen Professor of Materia Medica. In 1863 he published in the Canadian Journal, a "Flora of the vicinity of London." He was a leading spirit in establishing the Entomological Society of Ontario, and was for three years its President, and during the same time President of the Ontario Fruit Growers' Association. One of his greatest works is in the interest of horticulture, namely "Insects injurious to forests and fruit trees." At the present time he is Director of the Dominion Experimental Farms.



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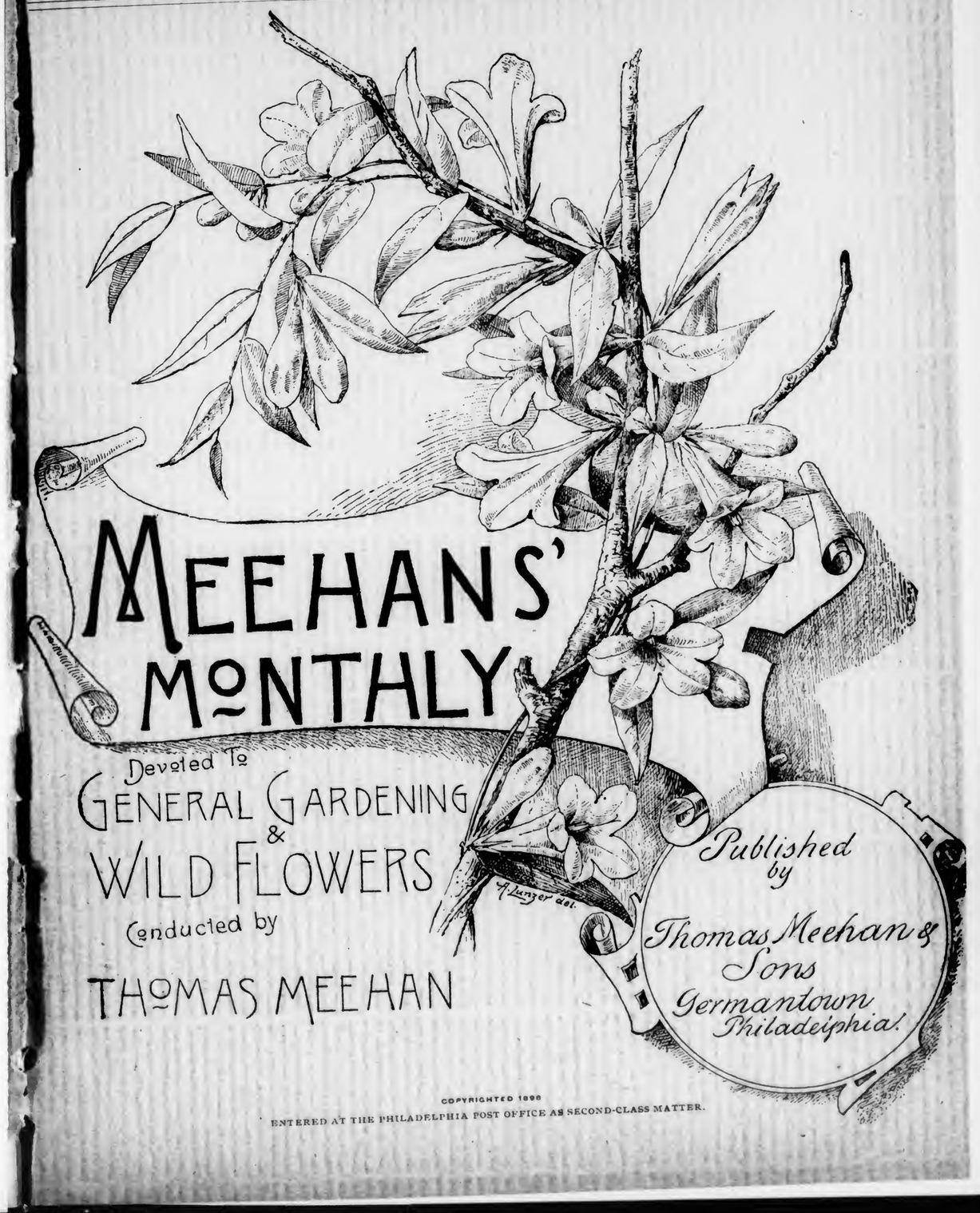

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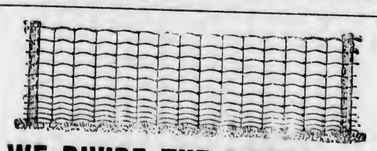

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PLATE 5

HABENARIA LEUCOSTACHYS

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WHITE-SPIKED ORCHIS.

NATURAL ORDER, ORCHIDACEÆ.

HABENARIA LEUCOSTACHYS, Watson.—Stands one to four feet high, bearing a many-flowered, dense or open spike of rather large white flowers; leaves lanceolate, acute, diminishing upward; bracts linear-subulate, acuminate, equalling and usually exceeding the ovary; lateral sepals oblong, the upper ovate-oblong, two or three lines long; petals lanceolate and sub-falcate, oblique at base, more or less connivent with the bases of the sepals; lip three or four lines long, rhombic-lanceolate,—spur narrow, four to six lines long; beak of the stigma very prominent, ovate, more than half the length of the connective; glands linear—oblong, vertical; capsule oblong, sessile, six to nine lines long. Brewer and Watson's *Botany of the Geological Survey of California*.

This was first described by Dr. Lindley in his "Orchidaceæ" as *Platanthera leucostachys*. But the differences taken to distinguish *Platanthera* from *Habenaria* are so slight that—at least so far as the Pacific Coast species are concerned—Dr. Watson does not regard them as of sufficient weight, and hence remands them all to the original *Habenaria*. The magnificent white spikes are, however, so characteristic, that it is not surprising that Dr. Lindley chose the specific name *leucostachys*, in describing it.

If size and strength are to be characteristics of royalty, *Habenaria leucostachys* should be the king of American orchids. Before railroads spanned the northern portion of the American continent, the author of this had to do some thousand miles by stage, and Nevada floral scenery is impressed the more strongly on his memory by the huge spikes of this orchid,—three, four, and occasionally nearly five, feet high,—which lined the road-sides whenever damp, grassy, gravelly spots were passed. There seems to be nothing in general literature from which a popular account of it could be written. The drawing was made from specimens kindly furnished by Mrs. Ross Lewers, of Franktown, Nevada, to whom the reader is also indebted for the following charming account of its behavior in its natural home. "It grows here on the edge of alder and willow thickets, near running water, just as you saw it on your journey across the continent. It seems to love the company of moss, grasses, and rushes, in which also appear species of *Mimulus*, *Polemonium*, *Pyrola*, *Veratrum*, a yellow lily and columbines. Though growing in wet ground, it is more luxuriant in open, sunny places, than in shade. On the last Fourth of July (1893), I found some plants in flower which were about three feet high, which were growing on a bank formed by the construction of a water ditch. The soil was of very rich leaf mould. Though some of the flowers on the dense spikes had not yet opened, they were already twenty inches long. This bank was sloping to the east, and the flowers of the orchid made a charming picture among the wild roses, flowering currants, grasses and the Orange Lily, embowered as they all were among a few scattering bushes of a shrub with red twigs and small white heads of flowers (*Cornus pubescens*, probably) and scattering trees of alder and Balm of Gilead, with a background of pines on the higher lands beyond. It seems to have a partiality for this shrub (the dogwood above noted), as the finest specimens are found in proximity to it. When growing in the wet, springy places, among alders and pines on the mountain sides on higher altitudes, it does not flower till September. A friend tells me that, at this altitude, ferns (*Asplenium Filix-fœmina*) and the Nevada Snow-plant, as well as the grasses and pines, are its companions. For two or three years past, it has sprung up among the red-top grass in our orchard, the seeds having probably been brought down in the water used in irrigation. Here, the plants are only eighteen or twenty inches high, and the flowers are more scattered along the stem; but they are closer set, and the spikes stronger with each succeeding year. In this situation, a yellow twisted orchis and a "blue-eye grass" grow with them. Every attempt to cultivate them fails. They die out though others may be growing not ten feet from them in the orchard. It is not a common plant in our Sierras, though more common than its fellow orchid, *Epipactis gigantea*,—the latter, however, prefers dryer ground. Prof. Hilmen,

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It may be noted that in some respects this species resembles *Habenaria dilitata*, a species scattered freely over the northern part of both the Eastern and Western Hemispheres; but its larger size will strike one at once, and the more minute characters can then be observed. In Dr. Watson's "Botany of Clarence King's Expedition," it is described as a larger form of this species.

It will be conceded that in the preparation of this drawing Mr. Lunzer has given a masterpiece of instructive botany as well as an admirable lesson in the art of flower painting. He has given the whole three-foot plant on a single page. Rarely can a white flower be painted without some unnatural appearance of the greener parts. Here, the spike is so placed in front of the green as to appear the natural result of cutting into sections. The specimen selected is comparatively young, as the unopened buds show, and tells that it would have been much taller had it been allowed to grow. The perfect root system explains admirably how this class of orchid supports and perpetuates itself. There are fibrous roots and a pair of tubers. One of the tubers bears the flower-stem,—the other has a young bud at the apex. The under bud is the darker, and, indeed, is in an incipient stage of decay. The life of each tuber is but two years. One is formed this year by the help of the fibrous roots and leaves of the older one,—the next year it forms another tuber, sends up a flower stalk and dies when that dies. Thus it goes on from year to year,—one new tuber born and one dying each season. No increase follows this method,—the only new plants appearing from seed.

Just how the plant obtains its food is not clear. The point made by Mrs. Lewers, that the plant will not live under cultivation, has been noted in connection with many allied plants. It is now believed that in most of the cases some species of fungus attaches itself to the young plant in an early stage of its existence, and feeds on what the plant does not want, but preparing in return the food which the plant requires. Neither can live without the other. This dual relationship is termed living in symbiosis. It is possible that, when the plants are transplanted from their native places, the food required by the fungus is wanting.

The manner in which leaves pass gradually into bracts, and the parts of the inflorescence are beautifully seen in this orchid. The flowers which appear in the axils of the bracts come from axillary buds, which under some favorable conditions might have been branches with leaves. The flowers, in cases like these, are formed in an early stage out of arrested and transformed branches. It has been noticed that this arrestation is frequently in proportion to the activity of the spiral growth. All growth of vegetation is in a more or less degree spiral. A long-drawn-out spiral may result in a branch or flower stalk; a closely drawn in spiral is favorable to completely sessile flowers. The enormous activity of arrestive force in this species can be seen in the twisted ovarium,—possibly more twisted than in many other orchids. It is believed that it is the proportionate twist that determines the irregularity of the parts of the flower,—the greater the spiral activity, the more irregular the floral parts.

Dr. Watson gives the range of the species as: "From Mariposa County (California) to Oregon and Idaho,—also eastward to Arizona and Nevada,—flowering from July to September." According to this the specimens furnished by Mrs. Lewers are from the eastward boundary of its geographical range. In some orchids the lip of the flower is uppermost, while the sepals and less modified petals occupy the lower position. This may be seen in the genus *Epidendrum* of Florida, one of the few Epiphytal species of the United States, but of a genus which has a very large representation as we approach the tropics. This characterisation is wholly owing to the degree of twisting which the flower stalk is subjected to. Nature makes genera very easily in this way. To some extent this is true of the formation of species. The manner and direction of the growth-force plays an important part.

EXPLANATION OF THE PLATE.—1. A full-sized plant in three sections. 2. Twin tubers, the product of two successive years, and employed as storage reservoirs of food. 3. Fibrous or food-gathering roots. 4. The newer tuber for flowering the next year. 5. A section of stem with bract and flower enlarged. 6. Showing the twisted ovarium, finally the seed-vessel.

WILD FLOWERS AND NATURE.

THE DANDELION.

Dear common flower, that grow'st beside the way
Fringing the dusty road with harmless gold;
First pledge of blithesome May,
Which children pluck, and full of pride, behold,
High-hearted buccaneers, o'erjoyed that they
An El Dorado in the grass have found,
Which not the rich earth's ample round
May match in wealth—thou art more dear to me
Than all the prouder summer blossoms be.

—LOWELL.

SHORTIA GALACIFOLIA.—There are few lovers of botany and of pretty flowers who have not heard of the curious history of the *Shortia*. The great botantist, Michaux, traveled through the Alleghenies. Years afterwards, our Dr. Asa Gray was examining Michaux's herbarium in Paris, when he noted a single flower which had been passed over as of no consequence, or, at the best, an exotic which had accidentally gotten into the American collection. But Dr. Gray diagnosed it as a wholly new genus, and named it in honor of a great American botanist, Dr. Short. Though many tried to follow Michaux's track, it was only after many searches that a few plants were rediscovered, and Dr. Gray's belief, that the Michaux scrap must be American, confirmed. But it was still regarded as comparatively rare,—in short, it was believed to be an evidence that some species formerly abundant, are, under some law of decadence opposed to a law of organization, gradually dying out. It was left to a school teacher, an excellent botanist, Prof. T. G. Harbison, to dispel this speculation. He was the first to find that it was comparatively abundant. He conceived the idea of founding an educational institution from the proceeds of the sale of the plants. In this way arose the highly successful Wayne School, of Waynesville, North Carolina, and which, from the peculiar method of its establishment, has come to be known as the Shortia School. To accompany the illustration here given of this interesting plant, we have obtained from Prof. Harbison the following account of his share in the discovery:—

"I was interested in *Shortia* from the moment I heard of its history. I concluded that it might be found in considerable quantities lower down along the streams on whose headwaters it had been found. In the spring of 1887, with an extract from Michaux's diary, as a guide, I traversed the region he visited at the time he found *Shortia*. I found the place where the old settlers in the upper South Carolina valleys say used to be a Cherokee village, and this was doubtless the place where Michaux found *Shortia*. I was the first to discover the fact that it is not a high mountain plant, as is given in our botanies, and that it is grown most plentifully and luxuriantly in the low mountain valleys of South Carolina, and but sparingly higher up in the mountains. I saw it growing on the edge of a cotton field in a South Carolina mountain valley."

It probably furnishes a new chapter in the history of this very interesting flower.

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Dr. Watson gives the range of the species as: "From Mariposa County (California) to Oregon and Idaho,—also eastward to Arizona and Nevada,—flowering from July to September." According to this the specimens furnished by Mrs. Lewers are from the eastward boundary of its geographical range. In some orchids the lip of the flower is uppermost, while the sepals and less modified petals occupy the lower position. This may be seen in the genus *Epidendrum* of Florida, one of the few Epiphytal species of the United States, but of a genus which has a very large representation as we approach the tropics. This characterisation is wholly owing to the degree of twisting which the flower stalk is subjected to. Nature makes genera very easily in this way. To some extent this is true of the formation of species. The manner and direction of the growth-force plays an important part.

EXPLANATION OF THE PLATE.—1. A full-sized plant in three sections. 2. Twin tubers, the product of two successive years, and employed as storage reservoirs of food. 3. Fibrous or food-gathering roots. 4. The newer tuber for flowering the next year. 5. A section of stem with bract and flower enlarged. 6. Showing the twisted ovarium, finally the seed-vessel.

WILD FLOWERS AND NATURE.

THE DANDELION.

Dear common flower, that grow'st beside the way
Fringing the dusty road with harmless gold;
First pledge of blithesome May,
Which children pluck, and full of pride, behold,
High-hearted buccaneers, o'erjoyed that they
An El Dorado in the grass have found,
Which not the rich earth's ample round
May match in wealth—thou art more dear to me
Than all the prouder summer blossoms be.

—LOWELL.

SHORTIA GALACIFOLIA.—There are few lovers of botany and of pretty flowers who have not heard of the curious history of the *Shortia*. The great botantist, Michaux, traveled through the Alleghenies. Years afterwards, our Dr. Asa Gray was examining Michaux's herbarium in Paris, when he noted a single flower which had been passed over as of no consequence, or, at the best, an exotic which had accidentally gotten into the American collection. But Dr. Gray diagnosed it as a wholly new genus, and named it in honor of a great American botanist, Dr. Short. Though many tried to follow Michaux's track, it was only after many searches that a few plants were rediscovered, and Dr. Gray's belief, that the Michaux scrap must be American, confirmed. But it was still regarded as comparatively rare,—in short, it was believed to be an evidence that some species formerly abundant, are, under some law of decadence opposed to a law of organization, gradually dying out. It was left to a school teacher, an excellent botanist, Prof. T. G. Harbison, to dispel this speculation. He was the first to find that it was comparatively abundant. He conceived the idea of founding an educational institution from the proceeds of the sale of the plants. In this way arose the highly successful Wayne School, of Waynesville, North Carolina, and which, from the peculiar method of its establishment, has come to be known as the Shortia School. To accompany the illustration here given of this interesting plant, we have obtained from Prof. Harbison the following account of his share in the discovery:—

"I was interested in *Shortia* from the moment I heard of its history. I concluded that it might be found in considerable quantities lower down along the streams on whose headwaters it had been found. In the spring of 1887, with an extract from Michaux's diary, as a guide, I traversed the region he visited at the time he found *Shortia*. I found the place where the old settlers in the upper South Carolina valleys say used to be a Cherokee village, and this was doubtless the place where Michaux found *Shortia*. I was the first to discover the fact that it is not a high mountain plant, as is given in our botanies, and that it is grown most plentifully and luxuriantly in the low mountain valleys of South Carolina, and but sparingly higher up in the mountains. I saw it growing on the edge of a cotton field in a South Carolina mountain valley."

It probably furnishes a new chapter in the history of this very interesting flower.

SHORTIA GALACIFOLIA.

INTENTIONAL SECOND EXPOSURE

THE CHIMNEY SWIFT, AND OTHER BIRDS.—The Chimney Swallow articles in the March MEEHANS' MONTHLY remind me of their arrival from their winter quarters some forty-five years ago. We had an early spring that year and vegetation was more forward than usual. The blue birds, meadow larks, robins and thrushes, were nesting. The numerous species of little warblers had passed along on their way to their breeding places further north. The passenger pigeons had hurried northward in immense flocks, when a severe freeze came suddenly in the night, the cold increased the next day, doing immense damage to vegetation. At this time, the chimney swallows reached us, in immense numbers, and, as there were fires in every house, they flew around in flocks all day, exploring the chimneys all over the town, flying above and around the chimneys during the day. As night approached, they concentrated in one black mass flying so closely that one wondered they did not knock each other down. Their object seemed to be to find a place where they could find shelter from the cold,—flying under the high bluff and down deep in the ravines that pass through the bluffs towards the lake.

They finally settled in my ravine, as night approached, and we all thought they would die there in the night; but several of us remained in the cold to keep the shivering crowd from disturbing them. You may judge of my surprise and delight when on moving down the bank of the ravine I saw them flying in solid mass into the brick culvert under State Street bridge, and there they remained during the night, clinging to the brick walls and coming out in the morning fresh as larks. The wind had changed, the morning was bright and they were all right.

As to the cherry gum,—I've nothing to say, only that we had no cherry trees on this side of Lake Michigan at that time, except here and there a tree in the woods of the wild black cherry, *Prunus serotina*.

The rosin weed was plenty at that time, but swallows' legs are so much shorter than their wings that they would make poor work of getting gum off level ground, and you will never see them alight except where they have an opportunity to descend far enough to outstretch their wings.

I feel sad when I think of the destruction of the feathered tribe in this country since the time I have referred to. The Passenger Bird passed through here in immense flocks; the warblers and other migratory birds, keeping their course along the shore of the Lake were seen in larger numbers than farther inland. Spencer Baird had assistants here regularly, as it was the best place in the country to collect rare specimens. We had the Evening Grossbeaks, the Crossbills and many other species not met with in such plenty elsewhere. Wild geese in plenty, and ducks, many of which would breed around our small lakes,—prairie chickens, in the mating season, could be heard cooing all over town in the early morning from the flocks that bred on the sand dunes under the bluff, and it seemed we would always have them; but since the forest fires in 1871, all this is changed and I have not seen a wild pigeon in twenty-five years, except a very few in Washington and Oregon, and then not so closely as to know whether or not they are the same species. ROBERT DOUGLAS.

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COILING OF A FERN.—What is the cause of the unilateral development of the frond of *Camptosorus rhizophyllus* figured and described in the April number of the MONTHLY, does not appear; but that the coiling is due to the combined pressure of the cells on that side of the frond which is developed seems evident.

The pressure of the cells on the developed side not being balanced by an equal pressure on the opposite side has forced the midrib over to the undeveloped side and the result is the coiling described.

We see in a warped board a similar effect produced by the same cause, viz., a greater lateral pressure of the cells on one side than of those on the other. At the apical end of the leaf the growth is normal, both sides are equally developed and the pressure on either side being balanced by a corresponding pressure on the opposite side, no coiling takes place. F. N. TILLINGHAST.

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This experience has been had before with other species or marked varieties of plums,—but after a while the eggs are fully deposited, as in the other species. Why they puncture the fruit, without depositing any egg in these earlier instances, is somewhat puzzling. Can it be that they know from the touch of the ovipositor that it is not the kind they have had former experience with, and that they know the kind they prefer is somewhere near?—and further, after they really find that there are no other preferable kinds about, fall back on the others as a sort of second choice? This is conceding a large amount of judgment, and consequently reasoning powers to the lower orders of creation; but the more we study them the more we are inclined to concede judgment as one of their endowments.

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"There is a single *Gymnocladus Canadensis* growing on Hackberry Island, in Grass Lake. The only one I know of in this part of the country. Have hunted from Lake Superior to Green Bay but have not met with a single tree. But Gray quotes it as being found as far North as Minnesota.

We have grown the *Gymnocladus* in our nurseries for years, but it proves with us a very slow grower; while in Kentucky, and other parts of the South, it is a rapid grower, proving that we are very near its northern limit.

The Hackberry is very rare in this part of the Central West, a few being found on above Island giving it its name."

Pursh, in his diary, expresses his pleasure and surprise at finding a solitary tree of the Kentucky Coffee in Oneida County, New York. The writer some years ago had a similar pleasure in finding a single tree in a wood near Washington, D. C. This, with Mr. Douglas' locality, probably furnish the exact boundary within which it may be found.

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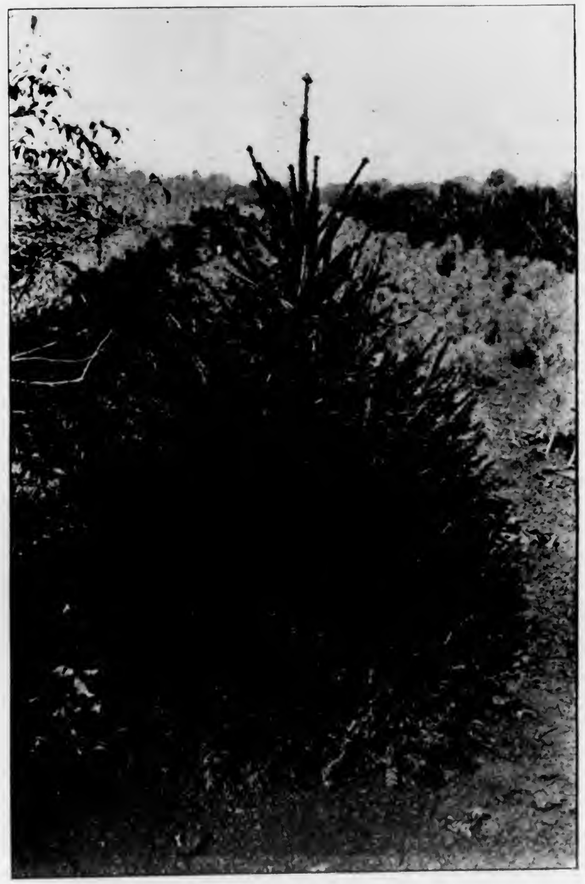

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INTENTIONAL SECOND EXPOSURE

however, wastes no unnecessary material on defensive spikes, for though the lower leaves within reach of the cattle and donkeys are very prickly indeed, you will find, if you look, that the upper ones, about six or eight feet from the ground, are smooth-edged and harmless. These upper leaves stand in no practical danger of being eaten, and the holly therefore takes care to throw away no valuable material in protecting them from a wholly imaginary assailant.

Often, too, in these prickly plants we can trace some memorial of their earlier history. Gorse, for example, is a peaflower by family, a member of the great group of "papilionaceous," or butterfly-blossomed plants, which includes the pea, the bean, the laburnum, the clover, and many other familiar trees, shrubs, and climbers. It is descended more immediately from a special set of trefoil-leaved peaflowers, like the clovers and lucernes; but owing to its chosen home on open uplands, almost all its upper leaves have been transformed for purposes of defence into sharp, spine-like prickles. Indeed, the leaves and branches are both prickly together, so that it is difficult at first sight to discriminate between them. But if you take a seedling gorse plant you will find that in its early stages it still produces trefoil leaves, like its clover-like ancestors; and these leaves are almost exactly similar to those of the common *Genista* so much cultivated in hot houses. As the plant grows, however, the trefoil leaves gradually give place to long and narrow blades, and these in turn to prickly spines, like the adult gorse leaves. Hence we are justified in believing that the ancestors of gorse were once genistas, bearing trefoil leaves; and that later, through the action of natural selection, the prickliest among them survived, till they acquired their existing spiny foliage. In every case, indeed, *young plants tend to resemble their earlier ancestors*, and only as they grow up acquire their later and more special characteristics."

From these facts is it not reasonable to infer that plants which are prickly or thorny were not originally so, but became so by a gradual development of sharp appendages, the purpose of which is to protect the plants from animals?

FRANK N. TILLINGHAST.

Greenport, N. Y.

The labor of an iconoclast is unenviable. To shatter such a beautiful idol as Grant Allen has constructed out of the gorse and the holly is surely a thankless task,—but the upper leaves of the holly become more entire as the tree grows by virtue of the general law which turns vigorous leaves into bracts as maturity is being reached. It is by virtue of the same law that changes the early deeply lobed leaves of many mulberries into wholly entire leaved ones when the tree is in its fruiting stage. It is therefore very doubtful whether the holly had any idea of "taking care not to throw away valuable material" when it was led by other influences to stop making thorns.

Those of us who have made the inner life of plants a study have come to see, as we think clearly, that plants would of necessity be as thorny as now, though never an animal had been created to browse on them. That spines do protect is clear to any one, and that this was all forseen by infinite wisdom may be conceded. It undoubtedly entered into the original general plan of the universe; but it seems incredible on the face of it, that it was wholly left to the chance accident of a browsing animal's appearance, before a thorny plant should exist on the earth. Mere chance, as a factor in development, seems a poor agent out of which to work out a harmonious plan.

GREEN COLOR IN THE ABSENCE OF LIGHT.—A correspondent writes:

"As to the origin of the green color inside of a pumpkin, I have read of similar cases before. It is my idea that the vacancy in the pumpkin is filled with air, the pumpkin not being impermeable to the same. Plants growing in a dark cellar, yet exposed to air, lack the green color,—but, may not the air in the pumpkin, in combination with the food being obtained from its parent, undergo such changes (chemical) in the laboratory of the plant as to account for the color? I am inclined to think that the *origin* of the *color*, *inside*, feeding on its parent (so *unnatural*), is in the *food*."

DICENTRA CUCULLARIA.—A correspondent from Crete, Illinois, remarks:—"The plate of *Dicentra Cucullaria*, or Breeches Flower in the March number, is so true to life! How many times I have wandered through the woods and ravines of New York, in early spring time, and gathered handfuls of these blossoms."

GENERAL GARDENING.

IN THE APPLE BLOOM.

Where no sunbeams with the shadow mingle,
Deep in cells where silence sleeps alone,
Root and fibre share the sudden tingle,
Stirring with a power beyond their own.

Swift the rugged stems throw on their covering,
Far in azure, trembling with delight,
Like a cloud—the apple blossoms hovering,
Lost from morning, drifting pink and white.

In the casks, then, where nor flash nor flicker
Ever lifts the long year's vaulted gloom,
Straightway beads and brims the golden liquor,
Feels the fragrance and divines the bloom.

Bubbles breaking from their dark and dreaming,
Boughs in blossom, roots beneath the sod,
Know their kinship, and alike, in seeming,
Serve the joyous footsteps of a god!

—HARRIET PRESCOTT SPOFFORD,
in *Harper's Bazar*.

EARLY GARDENING IN CHICAGO.—The magical growth of large American cities, amazing as it is to foreigners, can scarcely be realized even by ourselves. Those of us who love gardens and flowers can perhaps better appreciate the wonderful transformations; as these strong ingredients in human pleasures enable the memory to retain more vivid recollections of the beauty spots, now given up to huge piles of brick and mortar, than anything else can do. What Chicago is to-day, and what she was in the younger days of the writer of this paragraph, is a striking illustration of this wonderful transformation. In those times—the latter portion of the fifties—Dr. Egan's great and beautiful garden was—not exactly the Mecca of the American garden lover, for the great leader in gardening had not then been "translated" as Mahomet was,—but it was one of the great beauty spots in the great and growing city, that everyone loved to see. Many hundreds of dollars were spent on gathering together rare trees and flowers. Now—well, every one knows what Chicago is to-day. It is at least pleasant to know that one of his descendants, Mr. W. C. Egan, is now doing, for horticulture in Chicago, what his father did in his day, even if the city should after his departure burst a rolling wave over where his rural pleasures now abound. We have in our possession a copy of a letter written by Dr. Egan to his brother in Mt. Lebanon, Louisiana, which will surely interest our readers, giving as it does a glimpse of this famous garden, as well as of the happy character of one of Chicago's early founders. It is dated October 26, 1849:—

——"I must say I am pleased with your southern move. Your love for agriculture and its concomitant duties will relieve the mind of many a weary hour and would I should suppose, compensate in a great measure for those social deprivations which an educated mind must undergo in a new and thinly settled country.

Where did we all get a taste for fields and gardens? I am too lazy to work but no garden can surpass mine in this region. I have thrown down the glove to Cincinnati, St. Louis, Cleveland and Buffalo, all on the strawberry crop, and am so far the victor. My garden is in the city and contains over 50 acres. Flora and Pomona divide the honors and while I am their most ardent worshiper, they fail not to reward my devotion. The Cedar of Lebanon, the Araucaria of Brazil, the Irish Yew, and the Mexican Cypress lend their foreign charms to my garden home. My hedges of Arbor-Vitæ, and lawn of Giant Evergreens are the admiration and boast of our city whose motto is "Urbs in Horto." The stately Weymouth Pine waves over our sunny terrace with its melancholy music like the memory of ancient day. The double sloe with the double red and white Hawthorn glisten from the shrubbery with the brightness of other days; and I feel somewhat proud in the consciousness that whatever may befall me, I leave behind me a graceful and tasteful home which cannot be alienated from my children. But I must not talk so much of my place, yet it is the pride of my heart, and I know your taste will approve it. And although I have been facetiously termed the *delirium treeman*, the useful

and the profitable combine to render my occupation renumerative. I have shipped this evening to St. Louis $100 worth of Celery which was raised on one-eighth of an acre in my garden."

THE BRANCHING OF TREES.—A correspondent refers to a specimen of an inverted Norway Spruce which he has seen, and desires to know what were the parents of this curious hybrid, and how nurserymen proceed to cross them to get these singular results. Such a question has probably never been asked before, and yet it is reasonable considering the ideas of some good botanists, who see in any striking form of foliage a hybrid between two species. It is just as reasonable to regard a striking departure in the form of branching, as in the outlined form of a leaf!

There is, however, no necessity for bringing in hybridization to account for these variations. Nature abhors monotony. She makes no two things exactly alike, and variation is the most constant act of nature. But as the force impelling growth seems to come from innumerable centres, it weakens with its expenditure; hence variation dependent as it is on the degree of force, can only go so far. A striking variation is merely the result of an extraordinary expenditure of force; and striking variations are therefore rarer than the little variations seen every day.

In all trees, there is a normal form of branching, as of other forms. The White Pine usually branches at right angles with the trunk,—the Norway Spruce at an acute angle, though, by the weight of foliage they attain a rectangular position with age. Fig. 1, on page 85, shows the normal character of a Norway Spruce, when about six feet high, that has had good culture in a nursery row. But under some extraordinary growth-force in a given direction the branches all take a downward curve, and the variety "inverta," referred to by our correspondent, results. But this special impulse may be turned upwardly at another time, and then we get the pyramidal form, as illustrated in Fig. 2, on page 87.

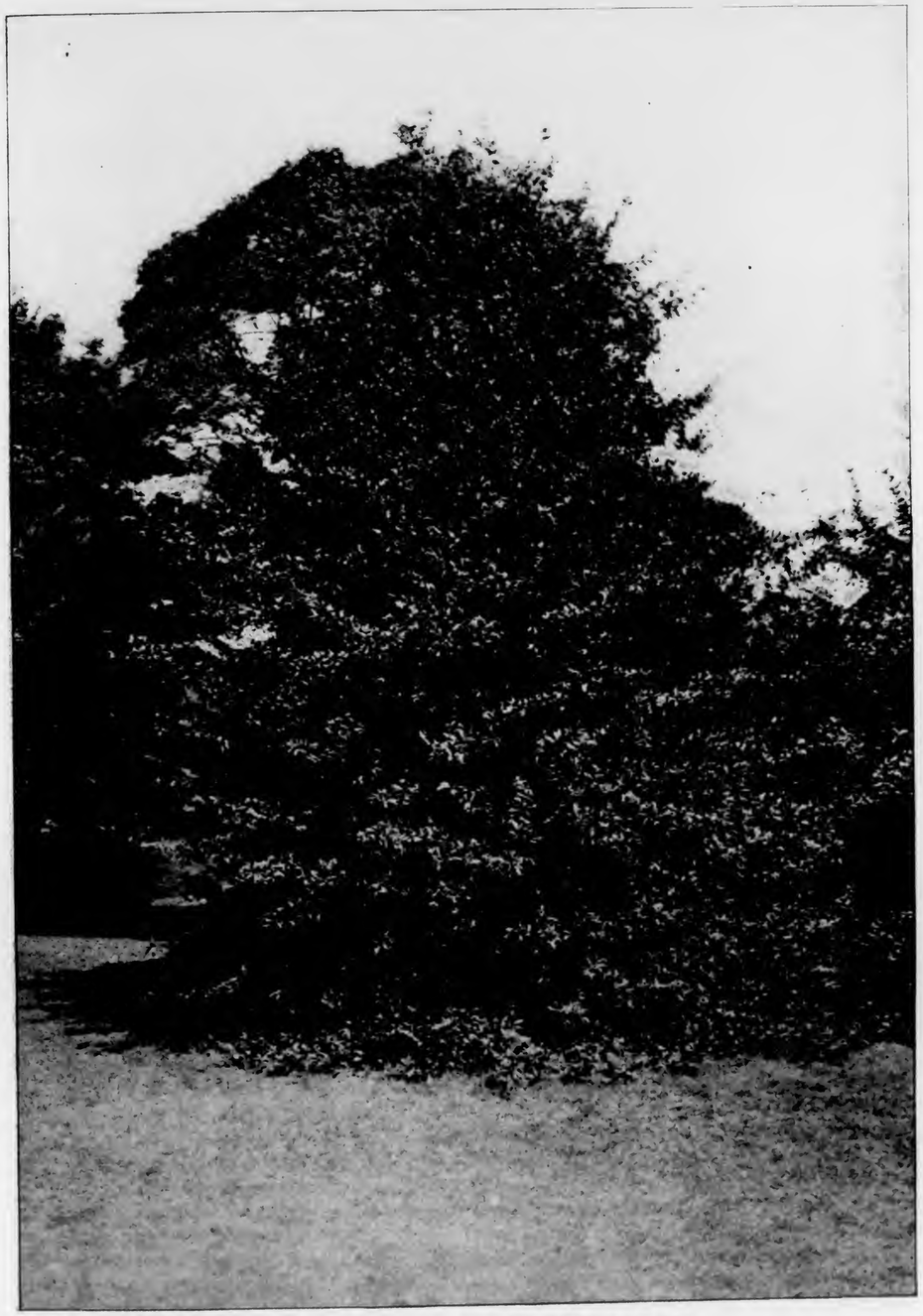
The impulse, if one might so term it, goes with the original cell of the individual tree at its birth, and continues through the whole life of the tree, whether it be continued by cuttings, grafts or layers, and to some extent follows through the seeds. Is, in fact, hereditary to a slight extent.

The nurserymen simply select these outlying wanderers from the central type as they show themselves in the seed bed, and propagate from them.

These peculiar forms are not made use of in gardening to the extent they might be. The Pyramidal Norway Spruce, for instance, gives a fine effect where upright plants are desirable. Possibly the extra cost is against the general use, as plants which have to be raised by cuttings or grafts will necessarily be more expensive than where a few thousand plants can be grown by merely scattering a handful of seed.

QUERCUS IMBRICARIA, THE LAUREL OAK.—The oak of general literature is an oak with lobed or divided leaves. The botanist recognizes this to some extent. Many botanical names have *quercifolia*—the oak-leaved—for the specific appelation, a lobed or cut-leaf always entering into the idea. An oak-leaved form, has come to be understood as the normal form which the English Oak, *Quercus Robur* assumes.

But of the three hundred and thirty-seven species of *Quercus* now recognized as such, a comparatively small number are lobed like the famous one of England, or like those generally found in our north-eastern regions. Entire-formed leaves prevail. In the southern portions of the United States, entire-leaved forms give the chief character to the oak-wood scenery. There are a few entire-leaved forms in the North which give much pleasure in garden art, by their foliage, which, in these localities, are styled peculiar. One of these is the Laurel or Shingle Oak, of which a specimen about twenty-five years old is illustrated on opposite page. This is from a plant growing in the Michaux Grove of oaks in Fairmount Park, Philadelphia. It is found abundantly in Ohio, Indiana and adjoining States, becoming rarer westwardly and eastwardly. When suffered to grow from the ground, the branches spread out in beech-tree fashion, and with its shining green, lance-formed leaves, it is difficult to persuade the average observer that he has a real oak before him. The Willow-Oak, *Quercus Phellos*, makes pretty branching specimens,—but we have seen none to compare with *Quercus imbricaria*, as illustrated here.



QUERCUS IMBRICARIA--THE LAUREL OR SHINGLE OAK.

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QUERCUS IMBRICARIA--THE LAUREL OR SHINGLE OAK.

INTENTIONAL SECOND EXPOSURE

PLANTS FOR WINTER EFFECT, PYRUS ARBUTIFOLIA, ETC.—MEEHANS' MONTHLY in the February issue has done good to call attention to the many desirable native trees and shrubs so little used for winter effects in our grounds. Of *Pyrus arbutifolia*, he cannot say too much. In my small (3 acre) yard I have one plant, fully 10 to 12 feet high, blooming early in May. Its blossoms are very like the English Hawthorn, only more beautiful. Some of the blooms form berries which remain green until fall approaches, and gradually turn from pink to a deep translucent coral-red to deepest crimson, which at this date are still fresh as in fall. Last year, my son while out botanizing, found these in clumps of hundreds, and planted seven additional around my tall plant, which make a grand show. I cut branches from one densely crowded with berries, after the leaves had fallen off, mingled with it the exquisite evergreen leaves of Cherokee Rose, placed in a narrow vase, and turned over it a glass globe. This was November, 1895. To-day, March 2d, both leaves and berries seem as fresh as when gathered.

We find another variety of *Pyrus* with purple berries, equally as desirable, and two varieties of buckthorn with round and oval yellow berries. Although we had the thermometer to register 3 degrees below zero, the coldest weather I have ever known here at the foot hills of Blue Ridge Mountains, yet these berries, the size of the English garden pea, are still fresh and unshrivelled. Besides these, I have a Catalpa which bears black bean-like pods, ½ inch in diameter, nearly 9 to 12 inches long, with a Sweet Brier Rose, whose tips I often mingle in with their odorous leaves and the evergreen leaves of the native Cherokee Rose.

This rose ought to be hardy north ; and none can rival it for special purposes. It bears pure waxy-white single blooms, with such quantities of yellow stamens that it adds much to the beauty of the plants.

Spartanburg, S. C. MRS. J. S. R. THOMSON.

FORESTRY KNOWLEDGE.—I wish to sincerely thank you for such sensible, timely and valuable, statements relating to forestry as these, viz.: "Forests depend upon climate and not climate upon forests. Better observe more and read less." The first is a great general, fundamental truth and whatever slight limitations there may be to it we leave for future scientific investigation to determine. The second is sound advice especially the first clause of the sentence.

The recently published report of William F. Fox, Superintendent State Forest, New York, on the Adirondack Black Spruce, is exceedingly valuable. Its data is taken from the forests themselves. Foresters in the employ of the commission went into the woods, measured plots, counted trees, felled trees and measured their diameters and lengths and counted their annual rings and thus secured the important facts with which the report abounds. Many similar facts secured in the forests of Maine and New Hampshire by Austin Cavy, when in the employ of the United States Forestry Bureau, are published in the Maine Forestry Report. These facts are invaluable. Their evidence is admissable in court, for it is not of the hearsay, the read, or the theorized kinds. To me, the forests present many unsolved problems after years of study. The only way I see "to get out of the woods" in regard to forest problems is to stay in them and study them. "Observe more." Observation and experiment have convinced me, that hundreds of thousands of acres of the waste lands in your state can be cheaply and profitably put to the growing of timber by sowing or planting them with the seed of timber trees. A crop of timber as well as a crop of corn can be grown without the trouble and expense of transplanting. J. C. LYMAN.

Exeter, N. H.

OUR AMERICAN PLANE TREES.—Mr. George C. Nealley observes that he understands *Platanus Mexicana* and *Platanus Lindeniana*, another Mexican species, are both now referred to the Western *Platanus racemosa*. But *Index Kewensis* retains *Lindeniana* as a distinct species,—and *P. Mexicana* of Torrey is given as a synonym of *Platanus Wrightii*.

BADLY PRUNED TREES.—*American Gardening* has an illustrated article showing the evil results of leaving spurs or snags in pruning trees. These invariably rot, and cause the premature death of a tree. Branches should be cut close to the trunk. The scars soon heal over.

VAGARIES IN GRAFTING,—Correspondents keep us pretty well supplied with the vagaries of the public prints. It is hopeless to look for reform, and it is questionable whether any criticism by MEEHANS' MONTHLY will stop the out-pour of absurdities. Still we must be courteous to our correspondents ; and one desires to know how far the following is correct :

"The olive has been grafted on a juniper, a peach on a myrtle, pears on oaks, apples on plums, mulberries on figs, a rose on an orange, carnations on fennel, peaches on mulberries, and red and white grapes, with peaches and apricots, on the same stem, for as all buds are distinct, the stem furnishes nutriment."

Only plants closely related will unite by grafting. Possibly the grafting of lilacs on the privet is among the most remarkable feats of the gardener's art, as these are placed by botanists in the different genera of *Ligustrum* and *Syringa*. But they are of the same natural family, and perhaps closer related in their anatomical structure and physiological relations than would appear to the systematic botanist. It is indeed the physiological relationship, if one may so term it, that decides the matter.

ODOR OF THE AILANTUS.—Mrs. Elizabeth L. H. Willis, Charleston, remarks ;

"Apropos of the odor of Ailantus trees, mentioned by Mrs. Munro, in your magazine for January, I wish to say that I had my first experience with the pistillate Ailantus last year, and it was altogether delightful. A young tree, about twenty-five or thirty feet high, grows in my neighbor's grounds, and near my garden wall. Last spring it blossomed most profusely, and never a breath of disagreeable odor was wafted from it to our olfactories. The flowers were succeeded by dense masses of fruit each flat, spindle-shaped samara being suspended by one end and overlapping each other with the regularity and symmetry of fish scales. As the summer advanced each one of these graceful winged seeds took on a rich, yellowish-russet, verging to crimson, and these gay clusters contrasting with the handsome foliage made the tree a thing of beauty for many weeks."

The point made by Mrs. Willis in regard to the beauty of the Ailantus when covered with its bright samaras is a good one. Even though the tree had a stronger odor than desirable, the glorious beauty would pay for it all. For this, if not for the less degree of odor over the male, the female tree is preferable.

GRAFT PROPAGATION.—"The art of propagation of plants is something of which no one, however great his experience, can say he is entire master. This fact is the more forcibly impressed upon me when I wonder why I am not very successful in grafting the White Persian Lilac and yet entirely so with its parent the Purple. Can you explain why this is ?"

Most lilacs are now grafted in the same manner that apples and similar roots are grafted. A piece of root is cut into sections. A wedge neatly and smoothly cut is inserted into a clean slit in the root, and then tied together with some soft material. The accompanying sketch illustrates it.

Some use waxed paper, as it keeps the moisture out, and thus guards against decay. The aim of the root grafter is to get the scion and root to granulate together as soon as possible. Just how to effect this can only be learned by experience in each particular case. A man may be eminently successful as a grafter of apples, and yet fail wholly as a grafter of roses. The apple will granulate freely under a low temperature. If the grafting be done in mid-winter, and the grafts set together in sand or damp sawdust in a cool cellar, the granulation will be so complete that when set into the open ground in spring the apples will sprout at once and grow almost with the vigor of seedlings. It is more than probable that the difference in the success of our correspondent with the different lilacs is that in the one case he has struck on the right temperature to favor union in the one case, but not in the other.

THE CARPENTER IRISH YEW.—Possibly one of the finest specimens of Irish Yew in our Country is that represented in the accompanying engraving. It is about 15 feet high, and 18 feet in circumference. It is near the residence of the late George W. Carpenter, one of Philadelphia's prominent and progressive men, and which residence is also shown in the picture. The Irish Yew is but an upright-growing variety of the common yew of the Old World, *Taxus baccata*, but its close growing, upright character gives it a self-protective character from cold winds. Old Boreas can not whistle through the branches as it loves to do through the open-branched normal form.

The Carpenter mansion is part of a tract which until a few years ago had about one hundred acres attached to it. It is in the

central part of that section of Philadelphia known as Germantown. Held by Mr. Carpenter mainly for his personal pleasure, and indeed of the community which always had free access to his beautiful grounds, it was recently placed in the market for improvement by the Pelham Company, and was estimated as being worth one million of dollars. Hundreds of beautiful suburban residences have been erected, and are still going up, but the new roads have been so constructed as to save the residence from destruction. Mr. Carpenter was a poor and friendless boy. As a lad he attended a lecture on Mineralogy by the celebrated Naturalist, Thomas Nuttall. He started to collect minerals for himself, and had them so correctly named and beautifully arranged that he was offered $1,000 for them. With this he started the drug business of which he had acquired some knowledge through working as a young man in a drug store. He became an active member of the Academy of Natural Sciences, of Philadelphia, and was a trusted officer of the Institution to his death. He became Nuttall's financial agent; and, on the latter's return from New Holland, Mr. Carpenter built capacious green houses for the plants raised from Nuttall's seeds. These greenhouses were for many years the pride of Philadelphia. The remains of these plants now form the nucleus of the Carpenter Winter Garden, attached to the great conservatory in Fairmount Park. When the question is asked, what is the use of science in the practical affairs of life? one might point to the career of Philadelphia's George W. Carpenter for an answer. The Pelham Company deserves the thanks of those who would encourage thrift and sound knowledge through the community, by preserving the Carpenter house. The dwelling alone, with the story of the Carpenter life, will be a living lecture of encouragement to many a struggling youth.

ABSORPTION OF SILICA BY PLANTS.—I was interested in the query of your Chicago correspondent, on page 54, of the March MEEHANS' MONTHLY, and have looked into the subject a little.

A great number of experiments have been made with various plants to see if there is any stiffening of the stem by the silica which the plant assimilates. By means of water cultures, corn (maize) has been grown by a number of German investigators with but minute traces of silica in the solution, yet the plants seemed as healthy with 0.54 per cent. of silica in the culture, as with 27.98 per cent in the field. As to the stiffness of the stem, Wolff found that the corn and oat plants containiug but slight quantities of silica "were as firm in stalk, and as little inclined to lodge or 'lay' as those which grew in the field." (Johnson's "How Crops Grow" (1894) Page 216).

I have examined the stem of *Equisetum hyemale* to ascertain whether diatoms are deposited in this stem so rich in silica, There are no such deposits, although the silica crystals in the stomata might at first glance be taken for such. It is impossible that it should be otherwise, since the plant absorbs its food by osmosis entirely, the nutrient particles are absorbed through their solutions which the carbonic acid and water of the soil, and the acid moisture of the microscopic root-hairs are able to produce.

The weakness of your correspondent's chrysanthemum stems is undoubtedly due to a too vigorous, rapid rather, growth, which does not allow the proper assimilation and elaboration of the food.

FREDERICK H. BLODGETT.

New Brunswick, N. J.

NEW OR RARE PLANTS.

CARNATION CULTURE.—Mr. Denys Zirngiebel, of Needham, Mass., has astonished the French florists by a letter to one of their horticultural magazines regarding the extent of carnation culture in America. He tells them that under our system of forcing varieties do certainly run out, but the American cultivator does not wait to restore them; but fills the gap with new kinds from seed. This not only keeps up healthy stock, but at the same time leads to the improvement of the race itself. Mr. Z. refers especially to the wonderful demand for a recent American variety of a salmon pink color,—Della Fox. And this will be supplanted in a few years by a new candidate for popular favor.

HAIRY FLOWERED CHRYSANTHEMUMS.—The curious class of chrysanthemums from Japan, which was introduced some years ago in the variety named Louis Bœhmer, has been vastly improved. It was little more than a curiosity at first,—but some really pretty forms have been raised both in this country and Europe.

CANNAS.—The rapid improvement in the Cannas, has led to a desire to eliminate the poorer, and selection becomes the order of the day. One called Queen Charlotte is believed to be among the first-class varieties. Expanded flowers are five inches across. The rich brown of the centre of the flower is edged by a wide border of gold.

THE HARDY FLOWER GARDEN.

DIGITALIS AMBIGUA.—A RARE INTRODUCTION.—In July, 1893, I found in blossom, in the grass in my front yard, a plant, which I at first sight thought was a yellow *Gerardia*, but upon examining it, I found it was not, nor could I tell what it was. It did not blossom in 1894, but last year it again was in flower—with a long spike of yellow flowers. It has only had one spike each year. Last summer I gave it to Prof. Merrit Lyndon Fernald, of the Cambridge Herbarium and he pronounced it *Digitalis ambigua*, and says it has never been found before in this country, so far as he knows.

The first year I found it, it had a lot of the rather rare snail *Acarthinala harpa*, upon it and around it, and last season it again had them on it, and I have never found them before or since.

The plant grows in the shadow of a hickory and fir tree, which stand not more than 8 feet apart, and about 6 feet from the walk, and 20 feet from the road. I have no idea where the seed could have come from. It grows in Asia and Europe.

HIRAM KELLEY MORRELL.

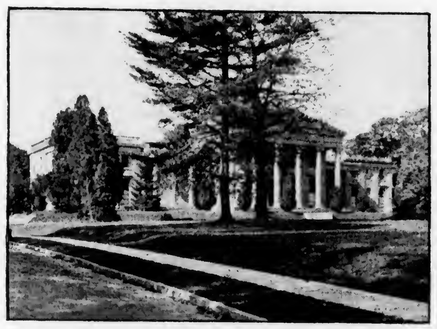
Gardiner, Me.

THE WOOD TULIP.—The numerous varieties which florists introduce from the wild parents often lead to the oversight of the originals, which frequently have great merits as herbaceous plants. Thus the parent of the modern hyacinth, *Hyacinthus non-scriptus*, is a valuable addition to any garden plot. In like manner, one of the parents of the modern tulip, *Tulipa sylvestris*, a native of the woods of Northern Europe, is one of the most desirable of herbaceous plants. Its large golden cups are freely produced,—and once planted it takes care of itself for all time.

HEUCHERA SANGUINEA. Almost all plants of the order of Saxifrages have white flowers, though here and there lively colors prevail. In the genus *Heuchera*, of which there are representatives in almost all Northern woods, from the Atlantic to the Pacific, the colors are usually white, and the plants not particularly striking. But the introduction of the red-flowered *Heuchera sanguinea*, from the mountains of New Mexico, has given the genus an interest to cultivators. Though discovered when locating the Mexican Boundary, and named by Dr. Engelmann, it has only recently made its mark as a popular herbaceous plant.

THE CARPENTER IRISH YEW.—Possibly one of the finest specimens of Irish Yew in our Country is that represented in the accompanying engraving. It is about 15 feet high, and 18 feet in circumference. It is near the residence of the late George W. Carpenter, one of Philadelphia's prominent and progressive men, and which residence is also shown in the picture. The Irish Yew is but an upright-growing variety of the common yew of the Old World, *Taxus baccata*, but its close growing, upright character gives it a self-protective character from cold winds. Old Boreas can not whistle through the branches as it loves to do through the open-branched normal form.

The Carpenter mansion is part of a tract which until a few years ago had about one hundred acres attached to it. It is in the



central part of that section of Philadelphia known as Germantown. Held by Mr. Carpenter mainly for his personal pleasure, and indeed of the community which always had free access to his beautiful grounds, it was recently placed in the market for improvement by the Pelham Company, and was estimated as being worth one million of dollars. Hundreds of beautiful suburban residences have been erected, and are still going up, but the new roads have been so constructed as to save the residence from destruction. Mr. Carpenter was a poor and friendless boy. As a lad he attended a lecture on Mineralogy by the celebrated Naturalist, Thomas Nuttall. He started to collect minerals for himself, and had them so correctly named and beautifully arranged that he was offered $1,000 for them. With this he started the drug business of which he had acquired some knowledge through working as a young man in a drug store. He became an active member of the Academy of Natural Sciences, of Philadelphia, and was a trusted officer of the Institution to his death. He became Nuttall's financial agent; and, on the latter's return from New Holland, Mr. Carpenter built capacious green houses for the plants raised from Nuttall's seeds. These greenhouses were for many years the pride of Philadelphia. The remains of these plants now form the nucleus of the Carpenter Winter Garden, attached to the great conservatory in Fairmount Park. When the question is asked, what is the use of science in the practical affairs of life? one might point to the career of Philadelphia's George W. Carpenter for an answer. The Pelham Company deserves the thanks of those who would encourage thrift and sound knowledge through the community, by preserving the Carpenter house. The dwelling alone, with the story of the Carpenter life, will be a living lecture of encouragement to many a struggling youth.

ABSORPTION OF SILICA BY PLANTS.—I was interested in the query of your Chicago correspondent, on page 54, of the March MEEHANS' MONTHLY, and have looked into the subject a little.

A great number of experiments have been made with various plants to see if there is any stiffening of the stem by the silica which the plant assimilates. By means of water cultures, corn (maize) has been grown by a number of German investigators with but minute traces of silica in the solution, yet the plants seemed as healthy with 0.54 per cent. of silica in the culture, as with 27.98 per cent in the field. As to the stiffness of the stem, Wolff found that the corn and oat plants containing but slight quantities of silica "were as firm in stalk, and as little inclined to lodge or 'lay' as those which grew in the field." (Johnson's "How Crops Grow" (1894) Page 216).

I have examined the stem of *Equisetum hyemale* to ascertain whether diatoms are deposited in this stem so rich in silica, There are no such deposits, although the silica crystals in the stomata might at first glance be taken for such. It is impossible that it should be otherwise, since the plant absorbs its food by osmosis entirely, the nutrient particles are absorbed through their solutions which the carbonic acid and water of the soil, and the acid moisture of the microscopic root-hairs are able to produce.

The weakness of your correspondent's chrysanthemum stems is undoubtedly due to a too vigorous, rapid rather, growth, which does not allow the proper assimilation and elaboration of the food.

FREDERICK H. BLODGETT.

New Brunswick, N. J.

NEW OR RARE PLANTS.

CARNATION CULTURE.—Mr. Denys Zirngiebel, of Needham, Mass., has astonished the French florists by a letter to one of their horticultural magazines regarding the extent of carnation culture in America. He tells them that under our system of forcing varieties do certainly run out, but the American cultivator does not wait to restore them; but fills the gap with new kinds from seed. This not only keeps up healthy stock, but at the same time leads to the improvement of the race itself. Mr. Z. refers especially to the wonderful demand for a recent American variety of a salmon pink color,—Della Fox. And this will be supplanted in a few years by a new candidate for popular favor.

HAIRY FLOWERED CHRYSANTHEMUMS.—The curious class of chrysanthemums from Japan, which was introduced some years ago in the variety named Louis Bœhmer, has been vastly improved. It was little more than a curiosity at first,—but some really pretty forms have been raised both in this country and Europe.

CANNAS.—The rapid improvement in the Cannas, has led to a desire to eliminate the poorer, and selection becomes the order of the day. One called Queen Charlotte is believed to be among the first-class varieties. Expanded flowers are five inches across. The rich brown of the centre of the flower is edged by a wide border of gold.

THE HARDY FLOWER GARDEN.

DIGITALIS AMBIGUA.—A RARE INTRODUCTION.—In July, 1893, I found in blossom, in the grass in my front yard, a plant, which I at first sight thought was a yellow *Gerardia*, but upon examining it, I found it was not, nor could I tell what it was. It did not blossom in 1894, but last year it again was in flower—with a long spike of yellow flowers. It has only had one spike each year. Last summer I gave it to Prof. Merrit Lyndon Fernald, of the Cambridge Herbarium and he pronounced it *Digitalis ambigua*, and says it has never been found before in this country, so far as he knows.

The first year I found it, it had a lot of the rather rare snail *Acarthinala harpa*, upon it and around it, and last season it again had them on it, and I have never found them before or since.

The plant grows in the shadow of a hickory and fir tree, which stand not more than 8 feet apart, and about 6 feet from the walk, and 20 feet from the road. I have no idea where the seed could have come from. It grows in Asia and Europe.

HIRAM KELLEY MORRELL.

Gardiner, Me.

THE WOOD TULIP.—The numerous varieties which florists introduce from the wild parents often lead to the oversight of the originals, which frequently have great merits as herbaceous plants. Thus the parent of the modern hyacinth, *Hyacinthus non-scriptus*, is a valuable addition to any garden plot. In like manner, one of the parents of the modern tulip, *Tulipa sylvestris*, a native of the woods of Northern Europe, is one of the most desirable of herbaceous plants. Its large golden cups are freely produced,—and once planted it takes care of itself for all time.

HEUCHERA SANGUINEA. Almost all plants of the order of Saxifrages have white flowers, though here and there lively colors prevail. In the genus *Heuchera*, of which there are representatives in almost all Northern woods, from the Atlantic to the Pacific, the colors are usually white, and the plants not particularly striking. But the introduction of the red-flowered *Heuchera sanguinea*, from the mountains of New Mexico, has given the genus an interest to cultivators. Though discovered when locating the Mexican Boundary, and named by Dr. Engelmann, it has only recently made its mark as a popular herbaceous plant.

INTENTIONAL SECOND EXPOSURE

FRUITS AND VEGETABLES.

THIN-SKINNED ORANGES.—The question of thick or thin-skin orange, depends much on the climate in which they are grown. Any variety of oranges grown in California will have a thicker skin than fruit of the same variety grown in Florida,—at least, such is my observation over a long series of years.

The average orange in Jamaica is thinner-skinned than the Florida. The orange requires a long-continued warm season to perfect its fruit. The warmest climate oranges are also the sweetest. Oranges are greatly influenced by conditions of growth. India River oranges, when at their best, are soft and velvety, bright and clear, juicy and well flavored. They reach this condition when grown in sheltered groves well shaded with palms and other native vegetation. No matter in what part of Florida, oranges grow under these favorable influences are equally good, and may be classed with the best from India River. On the other hand, oranges grown on cleared lands, within a hundred yards of sheltered groves, will be rough-skinned and more or less blackened by rust. One will rarely, if ever, find any rusty oranges in shady, sheltered groves. WILLIAM SAUNDERS.

Washington, D. C.

CHESTNUTS.—The American chestnut has the sweetest kernels, but are smaller, and the trees must be some fifteen or more years from the seed before they bear. The European, or Spanish chestnut, has nuts nearly double the size of the American, but are tamer in flavor. But the trees will bear at about ten years from the seed. The dwarf Chinquepin chestnut will often bear the second or third year from seed, but the nuts are so small, that they are not in general use. The Japan chestnut is a comparative dwarf, though a stronger grower than the American Chinquepin,—but the nuts are as large as the European chestnut, with about the same taste. Like the Chinquepin, they bear early. But all the kinds bear early when grafted from bearing trees.

BEURRE SUPERFIN PEAR.—This popular and magnificent pear is said to have been raised by a French nurseryman, Gouboult, in 1844, from seeds of the Duchesse D'Augouleme.

ARKANSAW APPLE.—Of this beautiful variety, Mr. H. G. Van Deman says, in *American Gardening*, that it had a prior name of Mammoth Black Twig, given by a brother of the raiser, Mr. John Crawford, of Rhea's Mills, Arkansas,—but Arkansaw was the name attached to it at the New Orleans Exposition, where it was first brought to notice. He adds:—

"One thing is certain, the 'Arkansaw,' (if you will agree to the name), is an apple of good qualities, both in tree and fruit, and is an honor to its native state, and she, and the originator and introducer, should have the full benefit of all that belongs to them."

DEGENERATION OF FRUITS.—Will varieties of fruit degenerate? has long been a mooted question with the fruit growers of the Old World, the trend of opinion being against the Knightian theory. But the opposition has been mainly on physiological grounds. But since the discoveries of the operations of minute fungi, which after awhile find a certain variety to be good field for their operations, and which then travel with the young plants raised, the objections are weakening. Physiologically, there is no reason that a variety should wear out; but in practice it is found that something happens, and new varieties are necessary.

APPLE, NORTHERN SPY.—A correspondent sends a note in praise of the eating qualities of the Northern Spy Apple, and says that a little company of friends were offering benedictions on the unknown friend of man who first raised it. This man was Herman Chapin, of East Blomfield, New York. Whether or not Mr. Chapin is still in the land of the living, we do not know; if so, it should gratify him to know how much pleasure he has conferred on his fellows.

KIEFFER A GOOD MARKET PEAR.—It is remarkable that the only pear that is exhibited freely on the fruit stands of Philadelphia, during midwinter is the Kieffer. This is in abundance everywhere. Whatever critics may say of their quality, somebody likes them, as they sell freely. A good point with them is that they do not rot easily by handling, as other pears do. They rank with the apple in this respect.

THE WERDER WHITE CURRANT.—We are apt to think that in our country we can outstrip the world in producing fine fruit, and very often we can. It is well, however, to know exactly what other countries can do. Mr. William Kleim, of Gotha, near Erfurt, has a currant, which is named Werder White, and if any American-grown fruit can beat it in size, he would be glad to know. Annexed is an exact copy of a bunch produced by that variety.

THE WERDER WHITE CURRANT.

HYBRIDS BY UNITED BUDGRAFTING.—A Missouri correspondent writes:

"At a meeting of our State Horticultural Society, last December, the question was asked 'can two halves of buds, of different varieties, be budded into a stock in such a way that they will unite into one bud and produce an intermediate between the two varieties from which the half buds are taken?' In the discussion that followed, you were said to have accomplished such a union of two varieties of roses."

In New York State, there was an apple which at times produced fruit which would have portions of the same fruit sweet, and the other sour. This it was claimed, was produced by some one splitting a bud of some sour kind and some sweet kind, and then inserting the spliced portions as a single bud, and thus this hybrid was produced. The writer could see no difference in the apple from an ordinary Rhode Island Greening, and suspected the history of its origin was but an after thought. It annoyed him that people should write and talk by the hour and for years about what any one ought to be able to test for himself so easily. He tried twelve spliced buds, using the very dissimilar kinds, Red Astrachan and Rhode Island Greening. Only two grew. They were grafted on to a bearing tree of Baldwin, growing on a dwarf stock, so as to bring them into early bearing. One of these subsequently bore fruit. The fruit was purely Red Astrachan, though the flowers were whitish like Rhode Island Greening, and not colored as a Red Astrachan flower should be. At that time the author concluded that to the extent of this light coloring, there had been a slight hybridizing result. But the paper was published chiefly in the hope that others would take up the interesting subject,—but, so far as the writer knows, there has been nothing but talk, talk, ever since.

A LARGE APPLE ORCHARD IN NORTH CAROLINA.—Prof. Heiges says that "In the extensive orchards of Mr. George C. Boggs, near Waynesville, N. C., there are 70 acres in apples, the trees being in a flourishing condition. Ralls Genet, Rome (Beauty), and Grimes are found very valuable owing to their late blooming proclivities. Mr. Boggs has planted largely of Newtown Pippin, which is grown of superior quality. The York Imperial is also extensively planted here and in the adjoining Goodrich orchard of 75 acres."

It has always been understood that one of the apples indicated was raised by Mr. Caleb Rawle, in Amherst Co., Virginia, and that he named it for his daughter Janet. If this be correct the name should be Rawle's Janet, and not "Ralls Genet" as above.

THE ORIGIN OF THE NECTARINE.—There are many well-attested cases of nectarine branches appearing on peach trees, and no intelligent person doubts that the nectarine is derived from the peach.

BIOGRAPHY AND LITERATURE.

WELCOME SPRING.

Blow, winds! and waft through all the rooms
The snow-flakes of the cherry blooms!
Blow, winds! and bend within my reach
The fiery blossoms of the peach!

O Life and Love! O happy throng
Of thoughts; whose only speech is song;
O heart of man! canst thou not be
Blithe as the air is, and as free?

—LONGFELLOW.

WM. BROWN SMITH.—The American nursery trade and horticulture in general have lost a noble and intelligent representative in Wm. Brown Smith, of Syracuse, practically the founder of the great nursery firm which in the early part of the writer's career was known as Thorp and Smith. He was not only a successful nurseryman with a world-wide reputation, but was closely identified with the successful growth of Syracuse in many ways, and was honored and beloved by all who knew him. He was born at Brighton, Monroe County, New York, on the 2d of March, 1815. He was early thrown on his own resources, and learned the trade of a cabinet maker. But though he had to work for from $4 to $7 per month, he had saved $100, by the time he was 21 years of age. Four years from this time he had saved $1000. Four years afterward he paid Alanson Thorp $2000 for a half interest in his five acre nursery, which eventually comprised several hundred acres, one of the largest and best known in the country. He leaves three children. His son-in-law, Edward A. Powell, and two sons, have had the business for some years past, under the firm name of Smiths, Powell & Co.

LEWIS' LEAF CHARTS.—Number II of the beautiful and useful "leaf charts," prepared "for the use of Public Schools" by Miss Graceanna Lewis, of Media, Pa., has just been issued. Some of the species of oak, with their acorns, are the subjects of this number. It is by no means clearly wise that "for the use of schools," the names of the oaks are those employed in Prof. Sargent's admirable "Sylva." In not one public school in ten thousand will the Professor's valuable and expensive work be found, and more is the pity. In this chart we have *Quercus platanoides*, *Quercus acuminata* and *Quercus minor*. The school teacher desirous of knowing more of the oaks described will not find these names in any work readily to hand. They will not be found in the "Index Kewensis" even as synonyms. If occasion had been taken to mark on the chart that these names were adopted from Sargent's work for the older names in common use, in place of *Quercus bicolor*, *Quercus Castanea* and *Quercus obtusiloba*, there would be some light on what otherwise will be a profound mystery. No. III has since appeared.

POISONOUS HONEY.—Apropos of what has been recently stated as to the unreliability of "matters of history" in relation to poisonous honey, the following apt illustration is from recent public newspapers:

"Hammonton, New Jersey, January 9.—Harrison Rutherford and John Pilgrim, two young men of this place, nearly lost their lives here to-day by eating poisonous honey.

After eating heartily of the sweet, Rutherford went to school. While there he became unconscious and fell, cutting a deep gash in his head. Pilgrim was also taken very ill, but, as he had not eaten as much as Rutherford, he was not so seriously affected. The doctors pronounced symptoms as of strychnine poisoning. The bees had fed upon the belladonna plant, thus bringing the poison to the honey.

The young men are now out of danger, but very weak."

Surely such a powerful poison would be as fatal to a bee as to a human being,—and how should any one know on January 9th, in New Jersey, that the bees had collected the honey last summer from "Belladonna?" And what is Belladonna? many know what is called Belladonna in some parts of the world; but it is not probable *Atropa Belladonna* furnishes much honey to bees in New Jersey. Still it will now be written up in history, that Belladonna produces poisonous honey.

WAYSIDE AND WOODLAND BLOSSOMS.—This is an English work, issued in New York by the firm of Frederick Warne & Co., and is intended as a pocket manual for the rambler among British woods and fields. So many Americans now take to Old World pastures in the summer time, that it will be as useful to this class as to English people generally. Most of the more prominent ones are represented by colored lithographs, and the popular accounts of them, rendered in the Grant Allen style, give a charm to the modern wild flower, which the flowers of a generation or two back may well be jealous of. Even the British mushrooms and mosses are made to tell pretty stories about themselves.

PRIORITY IN THE NAMES OF PLANTS.—There can be no question about the necessity for some rigid rule in regard to the adoption of the names of plants, otherwise classification would fall into utter confusion. The rule, that the first name under which a plant is described should be adopted, is a good one; but there are so many cases in which this rule was not adopted, and names which were not the proper names have got into general use and circulation, that it is difficult to carry out the rule after it has once been extensively broken. Again the rigid rule requires that the name printed should be used in its original orthography; but surely this ought not to hold when it is shown that the original orthography was not that intended by the party who coined the name. This thought occurs through reading in a botanical serial the desirability "under the rules" of changing our pretty little wild flower, Chimaphila into Pseva, from a belief that this name was the original and published by Rafinesque. To all familiar with abbreviations, and how his peculiar hand-writing would lead to a mistake by the printers, this proposed name is a good illustration. Pseva was undoubtedly used by Rafinesque as an abbreviation of the Indian name Pipsissiwa, which has evidently no meaning, to Pseva. Why should it be adopted merely to comply with a law which has not been enforced for nearly a century.

THE HISTORY OF THE POTATO.—One often sees accounts of occurrences in the daily papers, worked up by reporters, nearly accurate, and yet with a few points so altered, that the whole story becomes ridiculous. The *Kansas City Journal*, quoted by the Chicago *Times-Herald*, of July 25th, has just such a story about the potato. According to the this, the birthplace of the "Irish" Potato is Santa Fe, in New Mexico. Its botanical name it says is *Dioscorea Batatas*, and this grows abundantly around Santa Fe. Our word "potato" comes from "Batatas." Dr. Ballard tells the reporter that this *Dioscorea* growing near Santa Fe, is the parent of the potato.

What Dr. Ballard no doubt did tell the reporter was that *Solanum Fendleri* grows around Santa Fe,—that it bears tubers about the size of walnuts, and, in everything but size, are similar to our ordinary potatoes. Dr. C. C. Parry, who first found it around Santa Fe, believed it probable that the potato was derived from this stock, and many now agree with him. *Dioscorea Batatas* is a native of China, and does not grow wild about Santa Fe. *Batatas* is a Spanish name for an edible root or yam, and our word potato is a corruption. The *Dioscorea* is known as Chinese Yam, and Dr. Ballard probably used the name in illustration of the manner in which the potato gets its name. The article, which seems ridiculous as it reads, would have been very acceptable if the reporter had paid closer attention to Dr. B.

THE ONION IN DISEASES OF ANIMALS.—Mr. Burnet Landreth says that the onion is in Germany "considered a very lucky vegetable, and is commonly hung on the houses where there are contagious diseases; even hung up before the disease appears, as a preventive. The writer, some years ago, when inspecting a large farm in Essex, England, saw, upon going to the stable, suspended from the beams many curious hangings, and upon inquiring was told that they were bags containing onions, a sure preventive against cattle diseases, the onion absorbing and retaining whatever poisons might be floating in the air, or be exhaled from the animals."

FRUIT MIXTURES.—The peach itself is derived from the almond. The *Gardeners' Chronicle* recently figured a fruit that was partly peach and partly nectarine. The editor says he has seen a fruit that was half an orange and half a lemon.

GENERAL NOTES.

GARDENING IN AMERICA.—It is often charged against gardening, in America, that gardeners and their employers are continually changing; but there are many instances of mutual good understanding covering many years. Mr. John Gillespie has been gardener on the estate of Mr. Dulany, in Loudoun Co., Va., for the best part of a good life time, resigning recently because of advancing years; and, as often in the Old World, it is pleasant to note that the son, an excellent gardener, has been appointed to succeed the father in the same situation.

ANEMONE PATENS VAR. NUTTALLIANA.—A correspondent writes that he hopes the Monthly may present a likeness of the Pasque Flower (*Anemone patens var. Nuttalliana*) at some future time. He says, "your eastern readers should make the acquaintance of this gem of the western prairies." This truly beautiful "gem" was figured in Vol. 1, Series 1, of the "Native Flowers and Ferns of the United States," Plate 13. It should be remembered that MEEHANS' MONTHLY is carrying on the work which "The Flowers and Ferns of the United States," inaugurated. The publishers can furnish this work to any who desire it.

CITY GARDENER AND FORESTER.—This is a new position, created by the City Councils of Philadelphia. The small city squares are now under the management of the Bureau of City Property. During the past eight years, a large number of small parks or squares have been purchased by the city, so that, altogether they comprise about 1000 acres. The chief of the Bureau desired an assistant especially qualified to care for the arrangement and general management of this class of work. Under the laws of Philadelphia, such appointments are made only on examinations. The questions are prepared by three gentlemen supposed to be well informed on the subject of the duties required. The questions are prepared and handed to the applicants in the examining room, where they write down their answers,—in addition to which the applicants are each separately examined on oral questions. A large number of applicants made their appearance on the morning in question,—but the larger number beat a hasty retreat on opening the envelopes which contained the questions. Twenty-one concluded to stand the test. One half of these were at once cut down through inability to write or spell properly. It was remarkable how many men with otherwise good qualifications were deficient in this first great essential to a position of this kind. Of the dozen that remained, there were four who were evidently first-class men, any one of whom would do good work in such a position. Their averages were nearly equal. The highest was obtained by Mr. John T. Lewis, a comparatively young man, but who has already had successful experience in public work of this character.

BREECHES FLOWER.—Mr. T. S. Gold, the able and esteemed secretary of the Connecticut Board of Agriculture, wonders why our plate represented the "Breeches Flower," instead of "Dutchman's Breeches," as it is popularly known in the East. The chapters mainly bring together the scattered facts about the plants illustrated, and "Breeches Flower" was the adopted name by the author from whom the description was quoted. But note should have been made of the popular designation referred to by Mr. Gold.

NEWSPAPER GARDENING AND BOTANY.—The *Lyon-horticole* indicates that they have the same trouble in the Old World from the "fakes"—our readers will pardon the inelegant but popular phrase—of newspaper and magazine writers as are found in the New World. It says that it is no uncommon thing to have them describe azaleas as climbing like grape vines, and giving to the hydrangea the fragrance of the rose. But such sinners as these are pardonable in comparison with the awful transgressors by whom we suffer.

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GARDENERS:—We shall be glad to furnish names of competent gardeners adapted to large or small places. Gardeners wishing situations should correspond with us. THOMAS MEEHAN & SONS, Nurserymen, Germantown, Philadelphia.

GARDENERS—On our register will be found names of Competent Gardeners, and we will take pleasure in sending these to any one requiring their services. Henry A. Dreer, Seedsman and Florist, 714 Chestnut Street, Philadelphia.

GARDENER—English, aged 38, married, small family; 24 years experience in growing orchids, ferns, stove and greenhouse plants, roses, carnations, chrysanthemums; also the management of fruit houses, vegetable and flower gardens, etc. State wages. Chas. Dumper, 119 Tallmadge St., Poughkeepsie, N. Y.

AS GARDENER, by a man of experience and ability, will be disengaged 1st of March next, thoroughly conversant with the management of a gentleman's country estate, unexceptional references for ability and personal character.
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HEAD GARDENER—*Estate Manager*—Situation wanted by a theoretical and practical gardener, 27 years experience in Landscape work, cultures under glass or out-doors, all branches of gardening. Best references from *first-class* places. Europe and U. S. February or later, "R. F.," Office, Meehans' Monthly.

GARDENER. Situation wanted as gardener by a thoroughly practical English-American, single, 8 years experience as gardener and florist. Excellent references. Address,
E. A. C., Box 311, Tarrytown, N. Y.

GARDENER—Wants situation. Scotchman, 30 years of age, married, no family. Practical experience in all branches of gardening. First-class references. Address, WM. ROBERTSON, 1619 Malloy Street, Philadelphia

GARDENER—Wants situation on private place, competent in all branches, by married man, age 34; three children, small; experienced in growing all greenhouse plants, highest reference for sobriety and integrity, five years in present place. M. B., care of Thomas Meehan & Sons.

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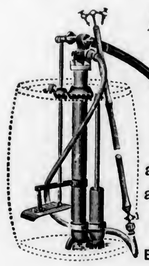

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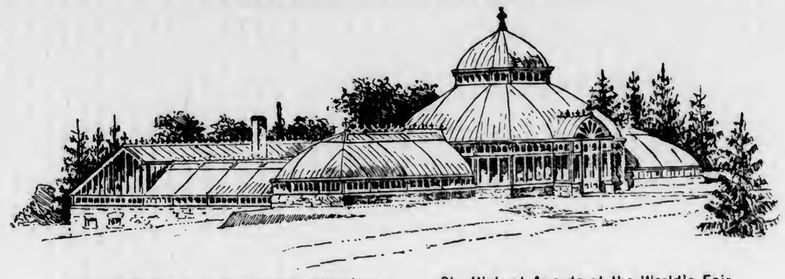

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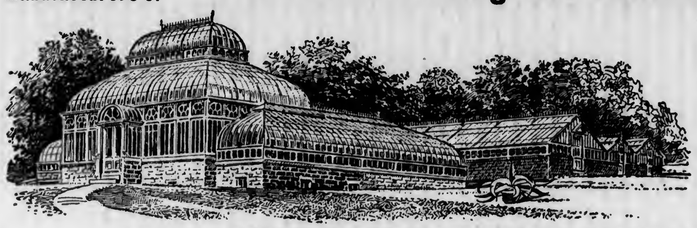

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LUPINUS PERENNIS

PHOTOCOPY OF ORIGINAL

INTENTIONAL SECOND EXPOSURE

LUPINUS PERENNIS.

SUN-DIAL LUPINE.

NATURAL ORDER, LEGUMINOSÆ.

LUPINUS PERENNIS, Linnæus.—Perennial; stem erect, nine to eighteen inches high, striate-angular, pubescent, somewhat branching, leaflets seven to eleven, oblanceolate, tapering to the base, smoothish above; common petiole one or two to four or five inches in length, raceme three to six inches long, loose, terminal, on a naked peduncle two to four inches in length; flowers purplish-blue with shades of dark violet, legumes about an inch and a half long, very hairy and dark tawney; seeds obovoid, variegated Darlington's *Flora Cestrica*, see also Gray's *Manual of the Botany of the Northern United States*, Chapman's *Flora of the Southern United States*, and Wood's *Class-Book of Botany*.

In the "Botanical Magazine" Miller's "Dictionary," and Barton's "Flora of the United States"—the last (a work something similar to ours, which ended with its third volume), are colored figures of *Lupinus perennis*, differing from one another, and from the illustration now given, though all of the same species,—the one in Miller the nearest like ours. These have, no doubt, all been taken from nature, and the fact shows that plants though of the same species have all a limited variation. When selecting a specimen for our artist, it was impossible to find many that had not had the older flowers damaged by the bees which actively made use of them. It seemed that truthfulness to nature should select one of these, as exhibiting its most usual appearance, in preference to the rare cases in which the whole raceme was perfect. In nature, however, wherever the plant is growing abundantly, and covering as it often does vast areas of ground, the destructive work of the busy bees is not apparent in the blue sheet of flowers the plants present,—for there are always large numbers coming on above to take the place of beauty in the stead of those the bees destroy. The family to which it belongs is one of the most classic in history. The name *Lupinus* is a very old one and was in use by the ancient Greeks and Romans. The exact identity of many plants of the ancients have been lost, and there is in many cases no certainty that plants now under an ancient name, are the plants intended by the writer who used them. But this is not the case with *Lupinus*. There seems to be but little doubt that the white Lupine of Europe—*Lupinus albus*, is the plant to which the ancients referred, notwithstanding the modern differences of opinion as to the derivation of the name. In Gray's "Manual of Botany," it is said to be derived from *lupus* a wolf, because it devours the fertility of the soil; and most American botanists seem to have adopted the same opinion, which is essentially that of Dr. Martyn a distinguished botanical scholar of the last generation. How improbable this derivation is may be gathered from the fact that this Lupine was not a devourer of the best as the wolf is, but was satisfied with very poor food. Theophrastus says that they grow only on sandy or poor soil, and in rich land can be made to produce a crop, only with difficulty. Indeed it was used according to both Pliny and Columella, as a green manure in order to make a poor soil rich, —that is to say it was sown as if for a crop, and, while still green, ploughed down into the earth by which the ground was fertilized as if the usual manures were used. There is a story in Æsop's fables about a boy who loved to cry wolf when there was no wolf about. The story could not be better illustrated in the vegetable kingdom than by a reference to its use in the case of this plant. Dr. W. P. C. Barton, referring to the above, adds, "the word is also supposed to be derived from (the Greek) *lupe*, grief,—a notion which is supposed to be supported by Virgil's epithet "*tristes lupini*," which he used not, perhaps, without a full stretch of the poet's license, from the fanciful idea that the acrid juices of the lupin he alluded to, produced a sorrowful cast of countenance." It is singular that the most probable reason for the epithet "sad lupin" has been generally overlooked. An old writer observes of the white lupin "the leaves have the sides contracted at night, and bend down, being bent back to the petiole." It has been customary from the earlist times to associate drooping leaves with sadness. We speak of

the weeping willow, and apply the term to all trees the branches of which bend toward the ground and it was probably from this drooping habit of the leaves that the Lupine derived its name, and suggested the idea of sadness to Virgil. This seems to have been in the mind of the poet, J. W. Davis, probably, when he wrote :

"———the Lupines here, as evening shadows rise,
Low droop their sorrowing leaves, and close their timid eyes."

The connection of the name, however, with the wolf has entered so widely into literature that the emblematists have dedicated the flower to "voraciousness,"—and it is almost impossible to look on this pretty plant with any sort of sentiment without this character entering largely into the idea. The great Latin poet Horace refers to the seeds of the Lupine in connection with counterfeit money. Plautus calls them *aurum Comicum*, or as we might translate it for our times, "stage money," because the flat seeds were used in comedies where real money was to be represented. The seeds being as flat as if pressed, and with a rounded outline, were well adopted to this use. From this form it was known to the older garden authors as "The Flat Bean," and though the "Bean" has a sort of vegetable-like sound, old Parkinson, Queen Elizabeth's gardener, remarks "it hath a flower which is accepted as delightful to many, and therefore fit for the flower garden."

The great use of the Lupine in the olden time was as an article of food. The "sorrowful cast of countenance" already referred to might be exhibited by those who partook of them in a natural state, for they are then very bitter; but when soaked in salt and water before boiling they are very palatable indeed. In this connection the story of the ancient painter Protogenes is in place. He lived in Rhodes about three hundred and twenty-eight years before Christ. Like those prophets who are without honor in their own country, none of his fellow citizens cared anything for his worth, till some foreigners found him out, and purchased his pictures at enormous prices. So great was his desire for accuracy that he spent seven years on the picture of Jalysus the founder of Rhodes. During all this time he lived chiefly on boiled Lupines, because of an impression that they favored an imaginative turn of mind. They do not, however, seem to possess any strong medical property. Culpepper the old astrological herbalist remarks that "the virtues are governed by Mars and Aries. The seeds are opening and cleansing, and are good to destroy worms."

All this however relates to the ancient white Lupine, or in some degree to the yellow Lupine which has taken in a great measure its place in the agriculture of Europe, though the species we now illustrate, *Lupinus perennis*, has much the same character as its more classic relations. Its medical qualities seem absolutely none. Rafinesque who investigated very closely the virtues of the plants known to him, merely says of our plant, "liked by horses and sheep," and Dr. L. Peyre Porcher, in his "Resources of the Southern Fields and Forests," does not mention it at all. Dr. Unger, a celebrated German writer and naturalist, in a paper published in 1858, on "Plants Used by Man as Food," says that, "The New World has also its wolfs-bean, in Lupinus perennis; and its bitter seeds are eaten from Canada to Florida," on what authority this statement was made is not known. The seeds have not been so used to any extent, so far as researches for this chapter have discovered.

Its botanical history has some points of interest. The half dozen species so long known to Europeans, are annuals, and this, the first American species known to them, being a perennial, suggested to the botanists of the time its specific name *perennis*. It has frequently been noted in the progress of this work, that we must not depend too much on the name as descriptive of the plant, and this is another illustration of this. Since our continent has been explored, more than fifty species have been discovered, and many of them are perennials. They abound chiefly on the Pacific side of the United States. The present species is one of only two found in the Atlantic portions of the United States, but has a remarkable distribution over a very wide extent of territory. It extends from the Atlantic coast across thorough Michigan and Minnesota by a form, closely allied if not exactly the same, through to Behring's Straits and up into the Arctic Seas.

———

EXPLANATION OF THE PLATE.—1. Full sized specimen, injured by bees, contributed by Mr. W. F. Bassett, from Hammonton, New Jersey. 2. Portion of its creeping root, or more properly, rhizome. 3. Nearly side view of a flower with an unusually pointed keel.

WILD FLOWERS AND NATURE.

A DAY IN JUNE.

And what is so rare as a day in June;
Then, if ever, come perfect days,
The cowslip startles in meadows green,
The buttercup catches the sun in its chalice,
And there's never a leaf nor a blade too mean
To be some happy creature's palace.—LOWELL.

———

LUPINUS PERENNIS, ADDITIONAL NOTES.—Along the Atlantic it extends to Florida, and Dr. Suckley on the Pacific Railroad Survey found it on the march from St. Louis to the Rocky Mountains. It is very rare for any American plant to be found over so wide a range. So far as the writer of this has seen it is nowhere to be found in such luxurient masses, and exhibiting such great beauty, as in the sandy soil near our sea coasts. The Scotch Botanist George Don, who must have visited our country in the early part of the present century, was also struck by its beauty in such situations as he tells us in his "General History" that he saw and admired it growing in such great plenty on sandy banks and in woods about Philadelphia and in Long Island. Of late years much attention has been given to the behaviour of plants, and to their relation to insects. *Lupinus perennis* has been particularly noted for the manner in which it ejects the seed. As the green pod dries the lobes contract, and finally splits with great force; the result being to throw the seeds many feet away. The seeds are ejected so easily by this process, that it is not often any seeds can be found in the open seed vessel, which has to be gathered before quite mature if seeds be desired. In its relationship to insects Mr. Scudder has noted that a butterfly of New England, *Thecla Scudderi*, has a peculiar fondness for feeding on these flowers.

Of its popular history there is not much to be said. Rafinesque tells us that in some places it has obtained the name of Finger-leaf. The name of Sun-Dial Lupine given because its leaves droop at mid-day under a hot sun, and the leaves at the same time ranged around a centre like the points on a sun-dial,—seems the more general of the two, and it is only desirable to retain one in prominence. Others no doubt have the same property and appearance, but have not been lucky enough to get the priority in the popular name. Another matter of popular interest may be that the Curthusian monks, finding it to bloom in France in their gardens on the 14th of July, dedicated the plant to Saint Bonaventure whose festival is celebrated on that day.

———

NEW JERSEY, THE PARADISE OF BOTANISTS.—It is doubtful whether the average "Jerseyman" has any idea of the affection entertained for its sandy wastes and swamps and marshes, by hundreds of people over this broad Union. The average hungry collector of wild flowers looks back on a trip to Jersey with much the same longing as did the ancient Hebrews when they remembered the onions, the cucumbers, and the fleshpots of Egypt. One of these longing souls thus writes to the conductors regarding a trip made to that State under date of April 16th.

"I was at Mays' Landing a few days since and found things pushing out down there. I ventured into one of the tangles and was peering into a shadowy depression filled with damp sphagnum when I suddenly become aware of a bright green snake returning my stare. I soon retreated and thereafter confined my travels to dry open places.

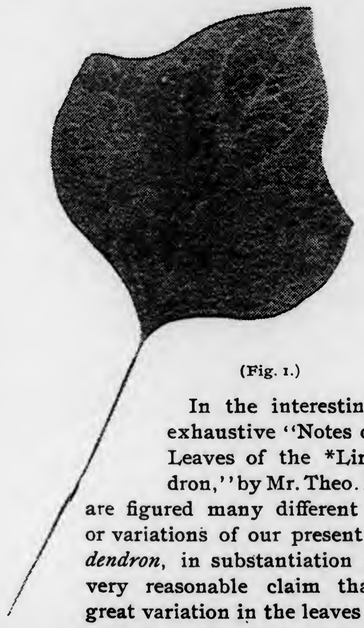
The smell of the young pitch pines is an ever new delight to me, as are the carpet of many tinted winter-green which carpet the woods, and the amber waters colored by leachings from the pine-needle floor. The breeze was cool and made the water lap and lap upon the pebble shore, while towards the middle of the inlet the reflection of the sky contrasted pleasingly with the deep green of the pines and white patches of sand.

What wonder the people love an easy life and grow to be poets and mystics and philosophers under these benign fostering influences?

PHOTOCOPY OF ORIGINAL

SOME RARE LEAVES OF LIRIODENDRON TULIPIFERA.—The *Liriodendron* has for a number of years been of especial interest to me. The three trees which stand in the spacious front yard of the old homestead, have long been intimate friends.

Taking the various discussions and numerous references concerning the variation of the foliage of the Tulip Tree as indicative of the general interest in its history, I would like to mention a few of the rare forms which I have found.



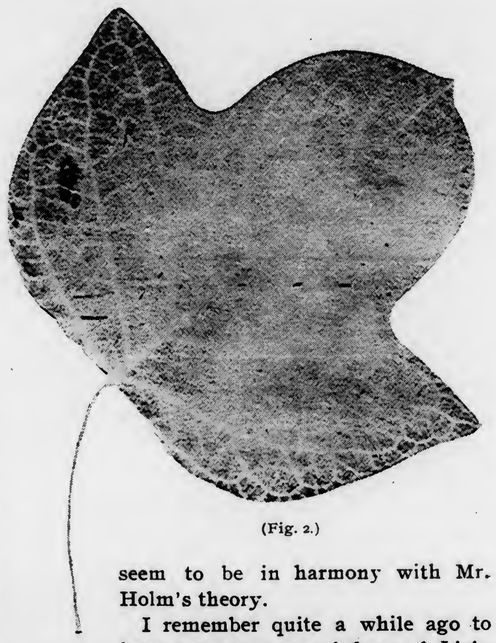
(Fig. 1.)

In the interesting and exhaustive "Notes on the Leaves of the *Liriodendron," by Mr. Theo. Holm, are figured many different forms or variations of our present *Liriodendron*, in substantiation of his very reasonable claim that the great variation in the leaves of the present species gives one strong grounds for doubting the existence of so many distinct fossil species. Mr. Holm comes to the conclusion also that our Tulip Tree at one time had a pointed leaf, or one in which the apex was present, his hypothesis being based upon the prolongation of the midrib—this projecting of the midrib, he claims, is evidence of a previous extension of the leaf in this direction.

Soon after reading his 'Notes,' I was so fortunate as to find a perfect pointed leaf. It came fluttering down from the tree as I stood looking up into its branches in search of it. It is a mature and symmetrically-formed leaf, Fig. 1 is an exact representation of it.

*Proceed U. S. National Museum, Vol. xiii.

Two years afterwards, Fig. 2 was found. It is larger, more striking in outline, than Fig. 1. I never saw any leaves that even approached these in outline, and yet, as we say of children often, "they have a general family resemblance." Another interesting form which might be designated as the hitherto missing link, was a number of leaves in which the apex was in an incipient stage—quite an interesting series was found, one of which is shown at Fig. 3. These three forms



(Fig. 2.)

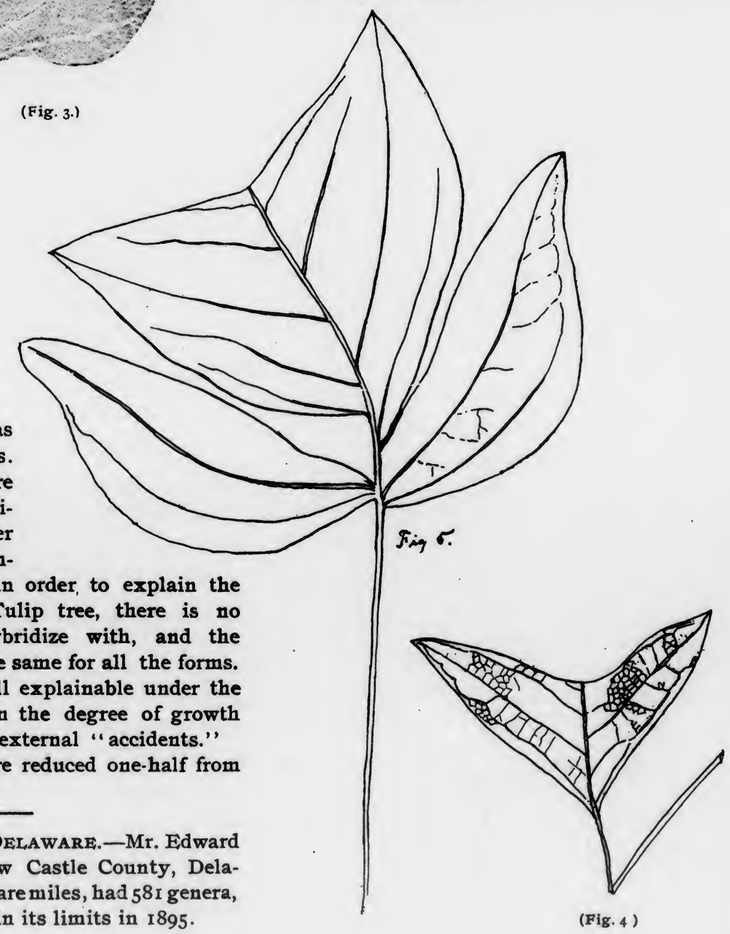
seem to be in harmony with Mr. Holm's theory.

I remember quite a while ago to have seen an unusual form of *Liriodendron* leaf figured in MEEHANS' MONTHLY, found some where in the South, similar to Fig. 4. I have found numberless leaves of this kind. Indeed, they in themselves form an interesting series, and it seems as if they might almost be considered the earliest type or real *Uhr Blätter* of the *Liriodendron*. Almost any *Liriodendron* leaf one may take up has a sort of resemblance to this curious shape. Sometimes upon seeing a child one involuntarily exclaims "how like its grandmother," etc., and so it is with our present typical *Liriodendron* leaf. If we look at it carefully, searchingly, may we not see representatives of by-gone ages, stamped by heredity upon it? The truncate apex of our

present leaf is often almost an exact counterpart of Fig. 4. In Fig. 5, we have an 'abnormal' leaf which in a measure demonstrates this idea. MRS. W. A. KELLERMAN.

This paper of Mrs. Kellerman is a valuable contribution to the Biological Department of Botany. The old idea of fixity of species, as originally established, dies hard. When-

(Fig. 3.)



ever changes, such as these noted in Mrs. Kellerman's paper, are referred to, "hybridization or some other condition of environment" is imagined, in order to explain the variations. In the Tulip tree, there is no other species to hybridize with, and the "environment" is the same for all the forms.

The changes are all explainable under the theory of variation in the degree of growth force, aside from any external "accidents."

The illustrations are reduced one-half from the natural size.

WILD FLOWERS IN DELAWARE.—Mr. Edward Tatnall says that New Castle County, Delaware, covering 512 square miles, had 581 genera, and 1465 species within its limits in 1895.

NEST OF THE CHIMNEY SWIFT.—I have been much interested in the discussion about chimney swallows. At my old home, in New York State, I have often watched these birds dive and dart from one cherry tree to another on the trunks of which were quantities of gum. I never saw them alight, but they would dart with a sort of vengence—I supposed at the time they were collecting the gum for their nests, as they built many in the large old fashioned chimneys of our house; but, as the gum was hard, I have thought since then perhaps they were after the insects which collected around this gum. Still, it was only at nest-building time that they frequented these trees.

MRS. FREDERICK C. JOHNSON.

Wood Vale Farm, Crete, Ill.

(Fig. 4)

PHOTOCOPY OF ORIGINAL

SUCCESSION OF FORESTS.—It would be of great interest to me, and, without doubt, to many of your readers, judging from the contents of some of the latest issues of your valuable MONTHLY; if you would give, in it, a table of the succession of plants and trees which begin to germinate and grow, after the cutting down of forests of especial varieties of trees, in this or other countries, and which are of a different variety and species from those cut down, *i. e.*, after cutting down the *Abies Canadensis* (Hemlock Spruce), why do the acorns of certain species of scrub, dwarf or pin-oaks begin to grow, and how long may one assume they have been in the ground without germination?

If this labor is too great can you refer to the authorities which treat on this special branch of learning? ISAAC MYER.

New York City.

It has been conceded that seeds may live when deep in the earth and excluded from changes of temperature, and an atmosphere capable of discouraging fungus growth, for an indefinite number of years. But this can scarcely apply to seeds at or near the surface as would have to be the case when plants appeared after a forest fire. In these cases the seeds are brought to the pine forest, by roosting birds chiefly,—and the little plants sprout, but are not observed. They will remain but a few inches high for many years. When the pines are burnt off these miniature plants start into vigorous growth, so that what was before obscure, is readily seen. The kind of succession, therefore, depends on the character of the roosting birds, and what they have fed on. If any one does believe that there are seeds of other plants than these, waiting a few inches beneath the surface for a chance to grow, the fact could be readily determined by washing a tub full of the earth. Vigorously stirred, the earth would be at the bottom and the seeds at the top. A glass vessel is preferable to a tub, as the successive layers, on subsiding, can be readily seen.

DISTRIBUTION OF SEEDS.—It is said that on a visit to the Island of Krakatoa, four years after the outburst of the volcano had destroyed every living thing, a traveller found 246 species of plants that had already found a home there. Essays have treated on this fact as inducing the wonderful power of the wind in carrying seeds long distances, and of the remarkable contrivances in the nature of wings by which seeds are enabled to be transported by winds.

Theoretically one might reason that wings are given to seeds to enable them to fly; but when the matter is tested practically the result is a surprise. In the case of the linden, the seeds which manage to get to any considerable distance will be found to be hollow. The sound solid seeds are all under the trees, or at most but a little distance away. The Dandelion, and similiar plants are continually used in illustration. If we watch a Dandelion as the breeze floats over the crown of pappus, the seeds are seen to fall a little aside, and it snaps from its fleecy crown, the latter floating away leaving the seed behind. If we gather a head and give it a jar, the pappus does not separate, and we can see how awkwardly it floats away. It is indeed impossible by reason of the weight, for the downy head to carry the seed far away. If one be caught on the wing and cut open, it will be found usually hollow or imperfect. In many pine seeds it will be found that only the hollow ones are carried any considerable distance. If we are to look for a single purpose only, it would be just as reasonable to conclude that wings were provided in order that the light seeds might be fanned out, in order that the good seeds might have a better chance to grow.

It is one of the weaknesses of modern scientific philosophy to imagine that nature has but a single purpose in view in the arrangement of things.

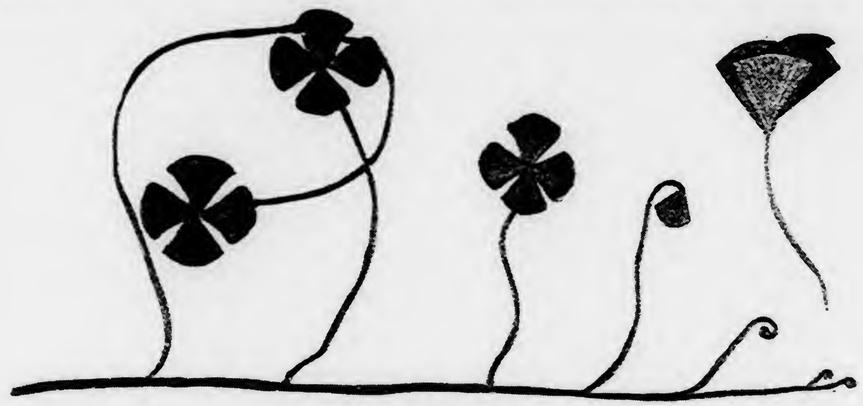
Nature is a grand instrument in which a few things can be made to produce an infinity of harmonious sounds. It is not fair to assume that any arrangement, however peculiar, was provided for any one purpose wholly.

As to the distribution of seeds on islands, the muddy feet of birds, their feathers, or even material for building nests, are more responsible for results than the winds. It would be interesting to know how many of the 246 species had wind-loving seeds.

OSTRYA VIRGINICA, THE HOP HORNBEAM TREE.—I notice in your recent publication some remarks in regard to the size to which *Ostrya Virginica* attains. In this connection I thought that my observations might be of some interest. The Hop-Hornbeam, or ironwood, *Ostrya*, is not a very common tree hereabouts, being found usually near streams of some size. I yesterday measured the finest specimen that I know of and found the girth at 6 feet from the ground to be 3 feet 2½ inches, and estimated the height at 40 feet. This tree is in the low ground along Ridley Creek, about half mile north of the Philadelphia and West Chester Pike. Another tree of the same kind, perhaps a mile further up stream, its somewhat less in size, but is still a fair-sized little tree. Two that I found along the Brandywine, near Lenape, are much smaller, but one of them is still quite young.

JNO. D. CARTER.

Westtown, Pa.



MARSILA QUADRIFOLIA.

MARSILIA QUADRIFOLIA.—The rare little *Marsilia quadrifolia*, which is nowhere indigenous in North America except at Bantam Lake, Conn., is a plant of more than ordinary interest. Although so restricted in location, naturally, it thrives in other localities when transplanted. It may also be grown in a tub like the water lily. Some specimens that were grown here in this way last summer, proved valuable objects for study. They were actually discovered asleep—a state in which one would hardly expect to find plants so nearly allied to the mosses.

As is doubtless known, the *Marsilia* usually grows in shallow water, but may also be found in the mud along the margin. When in water, the leaves are generally floating, but often the strong young leaves push up above the surface, and as they grow older fall back upon it. The fronds are coiled and rise from the creeping rootstock just as fern fronds do. The four parts of the leaf are folded up when young, one-half enclosing the other. It was among these new leaves that the sleep was observed. At the approach of night the two leaflets that were inside the leaf-bud again rise upward, and meeting the others face to face are enclosed by them. When the leaves grow older they do not close at night. Allied to this the plant has the trait of shutting its leaves when taken from the water, making it somewhat difficult to get good botanical specimens.

WILLARD N. CLUTE.

This very interesting plant is figure No. 4, in the second volume of the first series of "Flowers and Ferns of the United States." In the chapter accompanying the plate, it is suggested that some observer would probably discover that the leaves would close, like oxalis leaves, under peculiar conditions,—a point now made good by Mr. Clute. The plant is so nearly intermediate between a fern and a lycopod, that it is remarkable that some one who sees hybrids everywhere has not suggested it as a "hybrid genus." If we were to associate the plant with ferns in some degree, we might say it is probably the only instance known of fern fronds closing in this way.

BOTANY OF MEXICO.—Mr. C. G. Pringle is about to start on his 12th botanical exploration of little known portions of Mexico.

PHOTOCOPY OF ORIGINAL

SPRING IN GEORGIA.—An enthusiastic lover of nature writes in private letters worth publishing, the following, under their respective dates, of spring matters in Georgia which will certainly interest the readers of our general natural history column.

March 23:—Our spring comes with long lazy strides right onto and into the dead leaves, brush-wood and winter rubbish. The little scrub-oaks are so cracker-lazy they wait for their new leaves to shove off the old. The nearest approach we have to the turning-over-a-new-leaf kind of coming is on the coal-black burns under the pines. There the green comes out with a rush and its brilliancy against the black is marvellous. You know that the pine woods are very open; now fancy an acre or so of stately trees without under brush and the new grass under them as even as a carpet, and this in virgin forest. You can drive through it with a lively span going at a trotting pace. Of course we haven't much land of this simplicity of growth, but what we have is very beautiful. One gets to care for straight lines and level stretches and clear sun-colors here.

I have been studying a beautiful owl which was shot "just because it flew out," by a near neighbor who lives five miles away. I brought it on horseback all the way from where he gave it to me, and it looked as though it had been to sea with a very quarrelsome pussy-cat by the time I got it home. It turns out to be of the genus *Strix*. I was so astonished. They say an earnest seeker after truth is finally rewarded; but I got my reward in an enlarged horizon in human nature only. I carried the owl to nine authorities (native) both white and black, and they were all what we call "cock-sure" of what kind of an owl it was and they *all differed*. Finally I took it to Prof. Coues and treed it.

April 7th:—The young and early enthusiasts are fewer here and less varied than in Pennsylvania. There are violets in the pine woods in February. I saw the first on the 8th this year. These are *all* for the open woods. Along the branches you find (what you might expect) a far greater variety, for our wood land is poor.

The crab (*Pyrus coronaria*) is not growing scarcer here, but more abundant from year to year. Its prickly twiggery, and delicate leaves are found along all roads and in snake-fence corners; in old fields, along branches, and in the heart of the pine woods, too, where there is some approach to dampness. Let it be our national flower and be spread again. I am sure nothing here is more contented with any kind of ground.

I wish you could see the clouds and clouds of dogwood now.

INFLAMMABLE GAS IN TREES.—I have just been reading the article on "Inflammable Gas in a Hollow Tree," and I think I can "throw a better light on the subject."

This is neither a gas nor oil country, as it is mountainous, rocky and broken; yet, trees containing gas in their cavities, are of frequent occurrence in the spring time and occasionally one is found containing gas at other seasons of the year.

It is combustible, as I can attest from two different occasions, but I would account for its presence in an entirely different way from the one you quote from the newspapers.

Here, we have forest fires, insect pests and various other agencies which may injure trees, causing cavities to form of greater or less size. Many trees have what is called "windshake," and these cavities contain gases, formed in the trees. Sometimes these gases will ignite and sometimes not. Young trees more frequently contain the gas than old trees, from the fact that old trees are not so full of sap nor so liable to injury by forest fire; thus they are not so apt to retain this gas, nor to have the receptacle to hold it.

It is the custom here to "deaden" trees by girdling, prior to cultivating the land; and as nearly all of this is done in the spring just when trees are starting into growth, every farmer knows what it is to find a tree with gas in it. I have found, I feel safe in saying, as many as a dozen trees in a day that contained gas. The gas seems to be under heavy pressure, for it hisses loud at first, as the axe enters the crevice. If one happens to strike the cavity in such a way as to only cut a very small opening, he may get a match lighted before the gas has all escaped; and if he does, he is neither blown to atoms, nor the tree burned, nor the axe scorched, but there may be a faint flicker just long enough for him to say he has "struck gas," and is out. C. E. PLEAS.

Clinton, Arkansas.

GENERAL GARDENING.

SPRING IN THE GARDEN.

"'Spring! Summer! Autumn! Of all three,
Whose reign is loveliest there?
Oh! is not she who paints the ground,
When its frost fetters are unbound,
The fairest of the fair?

"'I gaze upon her violet beds,
Laburnums golden-tress'd,
Her flower-spiked almonds; breathe perfume
From lilac and syringa bloom,
And cry, 'I love Spring best.'"

—MRS. SOUTHEY.

TREES ON OLD WALLS. — Mr. Timothy Wheeler observes:

"Years ago I read of the Mountain Ash growing on a stone steeple in Utica, New York.

Often I have used this fact to illustrate (together with other similar facts) my view of the *origin* of maple sap here in the North where we make sugar while the ground and roots are solidly frozen, and the more frozen the more and sweeter the sap.

Question.—Whence the origin of the sap?

There is a gorge in a mountain here where the almost perpendicular wall of rock rises more than 100 feet; yet all along up there are little shelves where shrubbery and trees grow finely and thrive all summer, even through a drouth they are unwilted and green, yet they have no soil for their support; then, from whence comes their feed and growth? On our farms we have small trees and shrubbery growing and thriving on the same, yet no roots extend to the soil below.

Small accumulations of dust and dirt that the wind helps to collect among the roots will collect a little rain, but one sunny day, all is dry as powder, from whence then their support? These questions have long been settled in my own mind."

Mineral matters are found in the ashes of plants that grow out of the soil—air plants—and, for all that we are taught to the contrary, there is good reason for the belief that trees can take in these materials through the medium of the atmosphere.

ORNAMENTAL HEDGES.—Occasion has been taken in MEEHANS' MONTHLY, to point out that the list of shrubs for ornamental hedges may be widely extended, as any stiff growing shrub can be successfully employed. Mr. I. A. Bedford, of the Manitoba Experimental Farm, reports that in that high northern region he has enlarged the list considerably. He finds the following make excellent hedges.

Red osier cornel.—*Cornus stolonifera.*
Wolf Willow or silver bush.—*Elæagnus argentea.*
Snowberry.—*Symphoricarpus occidentalis.*
Meadow Sweet.—*Spiræa salicifolia.*
Native Rose.—*Rosa Layi.*
Saskatoon.—*Amelanchier alnifolia.*
Hazlenut.—*Corylus Americana.*
Pin Cherry.—*Prunus Pennsylvanica.*
Aspen.—*Populus tremuloides.*
Guelder rose-leaved spiræa.—*Spiræa opulifolia.*
Golden-leaved spiræa —*Spiræa opulifolia aurea.*

Besides these Mr. Wm. Saunders finds the following to make good hedges at Ottawa.

Acer glabrum.—Smooth Maple.
Acer monspessulanum.—Montpellier Maple.
Betula lutea.—Yellow Birch.
Betula papyrifera.—Papery or Canoe Birch.
Cornus sibirica variegata.—Variegated Siberian Cornus.
Cotoneaster buxifolia.—Box-leaved Cotoneaster.
Cotoneaster microphylla.—Small-leaved Cotoneaster.
Cotoneaster nepalensis.—Nepaul Cotoneaster.
Cotoneaster Simonsii.—Simons's Cotoneaster.
Calycanthus floridus.—Carolina Allspice.
Fagus sylvatica.—European Beech.
Hippophae rhamnoides.—See Buckthorn.
Larix americana.—American Larch.
Pinus ponderosa.—Heavy-wooded or Bull Pine.
Quercus Robur.—Black or common Oak.
Quercus palustris.—Pin Oak.
Rhamnus catharticus.—Cathartic Buckthorn.
Rhamnus Frangula.—Breaking Buckthorn (dense form).
Thuya occidentalis globosa.—Globose Arbor-vitæ.
Thuya tatarica.—Tartarian Arbor-vitæ.

CARE OF AQUARIUM FISH.—Fish in Aquaria turn on their side, or in other ways at times indicate a diseased condition. If they are taken out and placed in a vessel of salt water—water made about as salt as sea-water, they will usually recover. They should remain in the salty water about 24 hours.

PHOTOCOPY OF ORIGINAL

THE INFLUENCE OF FROST ON HARDY FLOWERS.—The following paragraph, we find in a New Jersey newspaper, referring to the garden of Mr. W. F. Bassett, of Hammonton.

"A yellow crocus has held its head above the ground for several days on the sunny side of William F. Bassett's house, even yesterday's severe cold and snow failing to wilt the bright little forerunner of spring. For a number of years a small patch of violets in a hedge near-by has bloomed profusely all through February."

It is worthy of use as a text for a lesson. Hardy plants are injured during winter chiefly by bright sunlight when frozen; or by the evaporation by cold, frosty winds. In a few words, injury from frost comes from the evaporation of the juices faster than the plant can supply them. The common garden chickweed affords a good illustration. It grows freely up to the advent of severe frost. A few days of sunshine on a frosty day will cause the green leaves to rot, but if some branches can get the shade of a few dry leaves, the plant's foliage will get through the winter uninjured. In Alpine regions Gentians and similar plants have been found blooming under snow, the plant's own internal heat thawing a little chamber around the flower. In any one's garden, violet flowers may be had very early if only a few dry leaves are scattered over the plants, to afford the same shade that a garden hedge would give.

GRAFTING ON CACTUSES. — The Arizona *Republican* has this to say about grafting on the wild Cactuses of that region :—

"Considering the near approach of Arbor Day and the great abundance in Arizona and in Phœnix of the Mountain Ash, the attention of the modern horticulturist should be attracted to that section of Virgil's "Bucolics" wherein is advised the grafting of the pear upon the Mountain Ash, "that due strength of the tree may be secured for the proper fruiting." 'Tis an experiment that yet awaits the western fruit-grower, and then maybe Virgil "wasn't onto his Job," and knew not that ye cannot gather figs from thistles.

Yet there have been tried as curious experiments in Arizona. Once near Tucson an eccentric German "took up" a quarter section of hillside whereon grew many a thousand giant cacti, telling that he saw no reason why the damp pulp of the Saguara should not be the best of material upon which to graft or implant grape cuttings. His primitive idea was to simply bore a hole in the Cactus and therein thrust a grape cutting. It is not in history that he succeeded.

Others for years believed that the fig might be grafted in some way upon the woody fiber or framework of the giant Cactus, giving as reasons that the fruit of the Saguara and of the fig are strongly alike in flavor and in shape. The climate in which grows the Saguara is in every way suited for both the fig and the grape, and the moisture of the "desert sentinel" is assuredly ample to dispense with all necessity for extraneous irrigation. Thus, eventually, may the desert blossom as the rose, and the waste places be made glad, and even to the desert dweller, remote from springs of water, be given the privilege of reclining 'neath his own vine and fig tree."

It need not excite surprise that the pear can be grafted on the Mountain Ash, as the two are members of the same family, *Pyrus*, and there is little difficulty in gardening in getting close relatives to unite by grafting. In the case of the Cactus and the Vine-families in no way related, the case would be different. It might not be impossible, though improbable, to graft a Gooseberry on a Cactus, as they are not distantly related. But though grafting in its proper sense,—that is the thorough union of the wood of two distinct species, could not occur between widely related plants and the Cactus, it would not be impossible to get a case of something like parasitism, by inserting a scion into the cellular tissue of a Cactus. It is barely possible that some kind of gooseberry would be found willing to send out roots in the Cactus tissue, and try to live on the food prepared by its host. As a matter of pure science, the experiment is worth trying.

RYE GRASS AND DARNEL.—Authors frequently confound Darnel and Rye grass. Darnel is *Lolium temulentum*. It usually grows among wheat, and was at one time erroneously supposed to injuriously affect bread; but ergot or some other fungus, it is now believed, should be charged wi h the offense. Rye grass is *Lolium perenne*, a very different species. Darnel is the "tares" of Scripture.

NATURAL GRAFTING.—In Shakespeare, one of the pretty scenes is where one tells another about the art which doth improve Nature—the art of grafting,—but Nature herself possesses the secret as well as the proud practiser of the garden art. Instances of branches joined together by inarching are not rare in our forests. A friend hands in a photograph taken in a New Jersey, open glade, wherein two American Hollies have become partners for life,—though showing as they have gone along, occasional disagreements, and occasional determinations to obtain a divorce,—again thinking better of it, coming together, and perhaps finally diverging in their old days for all.

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There were evidently two young plants starting together near each other. By a line on the bark starting near the ground, we see that the stems were distinct at one time when but an inch or two from the ground. This line extends apparently for a couple of feet upwardly, at which point they are now separate. The separate trunks are still alone but nearly touch for an additional foot. If the trees live a few years, they will meet, when the rough line from the ground will be that much further extended upwardly, and be all that will tell us of the original separation above. They have curved in a little, met, and united, only to curve out and get separated again. This sort of growing together is, however, not genuine grafting or inarching, but a mere over-lapping of wood growth. If this Holly were cut across just above the line, the layers of bark would be found at the point where the two trunks first met. There is no absolute union as in true grafting. Bark is often found in among the woody parts of fell'd timber. In all these cases it results from a branch having been overgrown by some more rapidly increasing portion of the tree.

STABLE MANURE.—Mr. Ramson, the noted vegetable grower of Boston, finds stable manure preferable to commercial fertilizers in growing vegetables. But he thinks those who use fertilizers largely are his good friends through having made less demand for stable manure, which he now gets more cheaply than heretofore.

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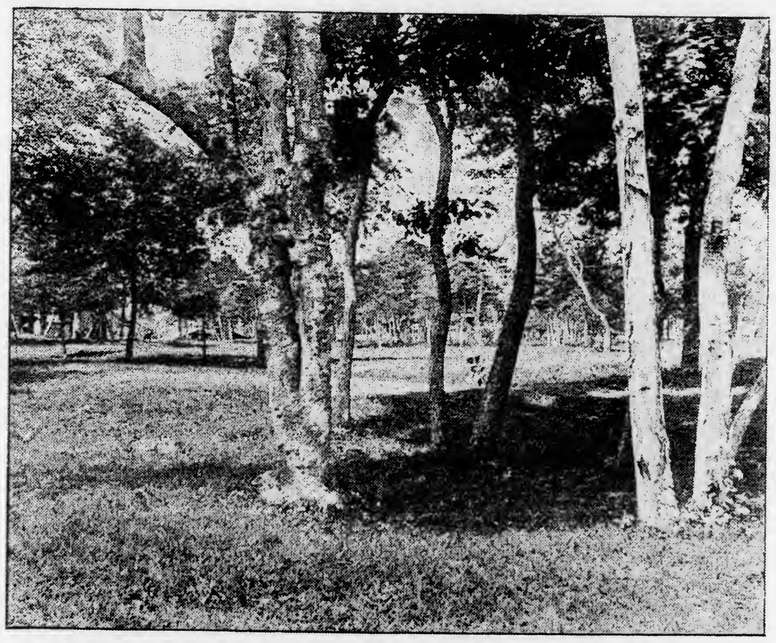

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PHOTOCOPY OF ORIGINAL

INTENTIONAL SECOND EXPOSURE

A PLEA FOR WILD FLOWERS.—It is something inexplicable that people who are interested in growing flowers do not cultivate the wild-flowers of their home region oftener than they do. It certainly is not for want of plenty of material from which to draw a supply, for all over the United States there are myriads of wild flowers, often of the rarest beauty. There is no place where any vegetation exists that has not its wild flowers, from the low wooded dells of the valleys, to the high mountain side; even in the high Sierras where great wastes of snow perpetually clothe the rugged steeps, the Snow Plant thrusts its gorgeous spike up through the cold, chilly covering of the mountain, and glows like a great ruby in its snow setting. And from among the thousands of varieties of plants growing wild all over the country it is possible to gather a great many floral treasures for the flower garden.

In the coldest of the northern states there are plenty of beautiful spring flowers, that together with some of the native ferns would make a fairy nook of some shady and secluded corner. Suppose one takes a corner of the dooryard that is sheltered by trees and shrubs, and plants large ferns, the common brake for instance, close against the fence, then filling the corner with Trailing Arbutus, Anemones, Bloodroot, Wake-robins and Checker-berry vines interspersed with Maiden-hair Ferns, there is a bit of woodland beauty that will take no care and grow prettier every year.

In many places there are numerous varieties of ferns that would add an airy grace to the corner inside the old gray fence, and then the Cypripediums or lady-slippers if put in there, would bloom a little later than the first of the spring flowers and prolong the effectiveness of the wood-garden.

If a big clump of golden-rod was planted in that sunny spot against the old board fence how it would nod its great plumes of gold in the chill winds of autumn; and a bunch of blue Fringed Gentians, would well repay being given a place where they could hold up their intense blue tips.

Away up in cold Wisconsin and Minnesota grow some of the most exquisite of ferns; the pale Hepaticas and Anemones march in with the violets when the long winter is done. The finest Cypripediums I have ever seen anywhere grow there, both the purple and yellow sorts. Some of the Lupines of Wisconsin are worthy of a place in any garden; I have never seen any grown from the best strains of seed offered by the florists, that could begin to compare with the great cluster of bloom of the creamy white Lupine of northwestern Wisconsin.

The farther south one searches for wild-flowers the finer they are in color, the more luxuriant of growth and tropical in appearance; in the Carolinas, Kalmias, Rhododendrons and Azaleas form dense thickets; while honeysuckles, Clematis and trumpet creepers climb the fences and reach long festoons of gorgeous bloom from tree to tree. And in Florida there is a wealth of the grandest flowers, many of them varieties that are carefully cherished as greenhouse treasures at the North; Tecomas, Yellow Jasmines and Passion Vines run riot; and members of the Amaryllis family make gay the damp marshlands; while the lakes, ponds and rivers abound in rare and beautiful aquatics.

California also has a large range of magnificent wild flowers, and although florists both at home and abroad have recognized their worth and beauty, it is very seldom that Californians take pains to bring these flowers to the home garden. There are rare lilies, Brodiæas, Fritillarias, Godetias, Calochortus, Azaleas, Salvias, Nemophilas, violets and countless other rare and beautiful native flowers, as well as many varieties of the most dainty and exquisite ferns.

So it appears that the cultivation of our native flowers and ferns is quite practical, and no one can urge as an excuse that they can get nothing worthy of culture.

It appears as if a great many people raised flowers with a feeling of envious pride, seeming to care only to outdo others; or to show off their wealth. But where there is a real love for flowers, there is a feeling of true love for all beautiful flowers without regard for their "fashion" or cost. And to the flower-lover there must ever be a beauty in the wildflowers of the home woods, or hills, or plains, as the case may be; and an airy grace to the ferns that hide in the shady nooks about the springs or in the deep woods, that is not spoiled by the fact that they are wild.

Let every floriculturist gather of the wild beauties that hold up their mute faces in the woodland depths, or those that laugh in the warm spring sun on the hill slope, and taking them home weave them into the scheme of the home garden. What a charm the wildflower corners will reveal when the warm, spring sunshine brings the first pale, sweet blossoms out; or in the warm climates how many new beauties will be discovered as the tinted pets burst forth in all their splendor, adding their graceful forms and rich coloring to the garden's glory.

IMOGENE E. JOHNSON.

Los Gatos, California.

The Conductors, when traveling through California, have noted that the native flowers of the localities are seldom seen in gardens. This is true of other western regions. The reason probably is that the settlers naturally love the flowers which remind them of their home gardens. In the older settled sections, wildflowers form a feature in many gardens,—and very interesting features they are, as our good correspondent pleasantly suggests.

SILICATES AS MANURE.—In the matter of silicates as a manure, remarked upon by your Chicago correspondent;—The stiffness of the stem is due to the favorable development of the woody substance. Experimental investigation has demonstrated the fact that a high silica content is accompanied by a relatively low production of organic matter. Regarding this diatomaceous earth fertilizer, that it is no longer heard of, answers the question as to its practical value.

Another point made by your correspondent deserves notice;—that mineral matters derived from organic sources are more readily assimilated by plants. This is wholly without foundation, in fact, as has been repeatedly proved by exhaustive experimentation. Crude rock phosphates, acidulated, have a crop-producing power fully equal to any other form of phosphate; the German potash salts are fully equal to wood ashes, and in some notable cases much better, as it is now settled that wood ashes promote the root scab. Nitrate of soda, or sulphate of ammonia, pure chemical salts, are not one whit behind dried blood in fertilizing value, and are better than barnyard manure. The Rothamsted experiments, continued for more than half a century, fully demonstrate this latter point.

On another page of your issue of March, you say,—"Mineral manures are best for vegetables grown for seeds or fruit, stable manure is best for leaf-producing kinds." I think it would be well to qualify this statement, as it might possibly mislead a florist. In stable manure, nitrogen is the predominating element both in quantity and ready availability. The special function of nitrogen in plant-growth is to promote the formation of branches and foliage, even at the expense of buds and *flowers*. Now, as to the minerals:—potash is essential to the proper development of the woody parts and the pulp of fruits, phosphoric acid has as its especial function, the maturity of plants—it is chiefly found in the seeds. To the florist, potash is by far the most important single element, as you are no doubt aware. It remains but to state that wood ashes, as a source of potash, must be avoided on account of the immense quantity of carbonates it contains.

S. PEACOCK,

Editor *American Fertilzer*.

Philadelphia, Pa.

When reference is made to expert testimony, such as that furnished by Mr. Lawes, in the Rothamsted experiments, one cannot but be struck by the difference in results as reported by other experts. If any one will examine the agricultural serials of a quarter of a century ago, they will find that Prof. J. C. Mapes made just as careful experiments as Prof. Lawes, and his results seemed clear to all of us, that plants profited more by mineral substances derived from organic material than from mineral matters derived directly from the earth. It seems that the influence of that mysterious agent we call life, is overlooked in those purely chemical discussions. We know, for instance, the exact chemical requirements of sugar as distinct from starch, but the chemist cannot make sugar. Only the living plant can do it. The varying life-power of the plants used in experimenting may perhaps account for the expert's varying results.

SALT FOR LAWNS.—A Harrisburg correspondent inquires for the best top dressing for lawns, when the soil is rather dry, but where the lawn was heavily dressed with stable manure last winter. Nothing is better than a light dressing of salt under these circumstances. Salt absorbs moisture from the atmosphere, and is beneficial in this way in dry soils.

PHOTOCOPY OF ORIGINAL

INSECT LIFE UNDER LOW TEMPERATURES.—I wish to add to the testimony of Mr. Geo. B. King, quoted by Mr. Wheeler, of Moscow, Vermont, relative to insects freezing in winter and thawing to life in spring.

I have seen this so many times in the case of ants that I do not see how it can be doubted by anyone who has taken the trouble to study the matter. In the northern part of Wisconsin, where the winters are severe, I have seen, in the rotten hearts of trees just felled, thousands of frozen ants which would crawl about very soon after being exposed to a fire. There could scarcely be any doubt that the ants were frozen, for I have made this observation when the temperature was from ten to fifteen degrees below zero Farenheit, when the wood fibres were as brittle as glass, and the bodies and legs of ants would snap like spicules of ice when attempts were made to bend them.

As to the freezing of live fibres there is an abundance of testimony. The latest you may find in the magazine number of the *Outlook* for January, 1896. It occurs in an article on Mr. John Burroughs, and this acute observer makes the statement. JNO. MADDEN, M. D.
Milwaukee, Wis.

It is necessary to repeat that there seems to be a misconception of the point in question. That not only animals, but plants also, will have some of their juices or liquids freeze in the winter time is too well known to admit of controversy. Twigs will snap easily when the thermometer is below zero, because of being frozen, and ice crystals can be readily discerned by the microscope. But the question is do they freeze *solid?* The contention is that the active living cells cannot do this, *and still live.*

LARGE-FLOWERED CHRYSANTHEMUMS.—We recently gave some information as to the method of producing the enormously large flowers on comparatively dwarf plants. Appended is another method given by a correspondent of the *Canadian Horticulturist.* In this it will be seen much stress is laid on having but a single stem :

"The method usually practised to obtain very large flowers is to root the cutting late in May or in June, then place in a small pot, and in two or three weeks put in a five or six inch pot, the side growth being carefully nipped off in order to throw all the vigor into the main stem, which must be supported by a stake, and tied. As soon as buds appear, select the largest and most perfectly formed one, and the plant should never be allowed to produce another bud to even the size of a pea. Thus with all the strength of the plant concentrated in one flower, and with all conditions favorable, flowers are produced that will measure six, eight and even ten inches across."

COST OF CITY TREE PLANTING.—People of little thought are often surprised that the cost of planting and caring for a tree is largely out of proportion to its first cost.

That admirable institution the Brooklyn Tree-planting and Fountain Society, offers to plant and care for trees when desired to do so by citizens, and gives the following, as approximately the cost :—

Cost of planting a tree under ordinary circumstances :

Cost of Tree (except in exceptional cases), ...	75c. to $1 50
New Soil, where necessary, . . .	1 00
Post and Wire Guard, ...	1 00
Cutting hole in flagging, where necessary,	1 00
Iron Plate, when used, ...	1 50
Labor, ...	1 00
Maximum,	$7 00

VITALITY OF SEEDS.—Prof. Wm. Saunders, the Director of the Dominion Experimental Farms, has made the interesting and practically useful discovery, that the vitality of seeds is largely affected by the season in which they are gathered. For instance he found that in 1894, a large number of cereals had a much larger percentage of growth than in 1893, and 1895. If this had occurred in only a single instance it would not have proved much,—but the results followed along a long line of articles.

THALICTRUM ANEMONOIDES.—Mr. S. W. Crandall, of Chicago, sends specimens of the Rue-Anemone, *Thalictrum anemonoides* from the vicinity of that city, more purple than usual farther east. This appears to be the case with *Anemone nemerosa*, which often grows with the *Thalictrum* and much resembles it. Is there a general tendency in white flowering spring flowers to acquire color as they travel westward ?

FRUITS AND VEGETABLES.

THE TIMBRELL STRAWBERRY.—In Minnesota this has been found to be a remarkably productive variety, coming in rather later than others, and thus prolonging the strawberry season.

THE EARLY ROSE POTATO.—Some varieties of potato soon degenerate if planted continuously in the same farm or garden. It is said the famous variety known as Early Rose, resists this degenerative tendency longer than most other kinds.

THE WOOLVERTON STRAWBERRY.—Mr. O. W. Blacknall, of Kittrel, N. C., grows the Woolverton Strawberry to six inches in circumference, having five berries on a common stalk, and the berries perfectly egg-shaped. It is a hermaphrodite or self-fertilizer ; and besides the beauty of the berries themselves, he regards it as an abundant bearer.

LUCRETIA DEWBERRY.—The Dewberry is earlier than varieties of the "High bush" or *Rubus villosus* type, but has not been much improved by fruit growers, though the well-known Wilson's early is believed to be in some way related to the Dewberry family. Of true Dewberries, however, in the eye of the fruit grower, the Lucretia is regarded as a very worthy representative.

CARROTS.—Economy in small things is usually the key to good habits in weightier matters, and even in the form of a carrot this good principle is studied. In the long and pointed forms a considerable portion of the narrower end is cut off by the cook. For this reason the stump-ended varieties are getting more and more popular. They are sometimes termed "half-long" in seedsmens' catalogues.

IMPROVED LETTUCE.—California is not satisfied with its high reputation in beating the world of gardening in the fruit growing line ; but is sending out its challenge in the line of vegetable growing. Eastern growers are coming to admit that there are few varieties of lettuce superior in general qualities to the California All-heart. In what other lines of vegetables does California intend to compete ?

HARDINESS OF PEAS.—It is remarkable that while surrounding conditions have little result in changing the form or general character of varieties, they do affect hardiness to some extent. Varieties producing seed in a Northern climate, are usually hardier in their descendants than those raised in warmer ones. This is found to be especially the case with peas, in which character the ability to resist frost in the earlier stages of growth is desirable. On this account most of the larger seedsmen have their seeding grounds for peas in Canada. But for all this there are some varieties that are hardier than others, though all will stand a good share of frost. A variety known as the Telegraph is one of the hardiest, and a favorite for very early spring planting.

AMATEUR CELERY CULTURE.—In olden times the chief pride of the amateur gardener was in the department devoted to vegetables and small fruits. It was wonderful what immense crops could be secured from a small space. The first operation in a new vegetable plot would be to trench it, as the task was technically called. The earth was turned absolutely upside down for some three feet in depth. As the subsoil brought to the surface was poor, a good coat of manure was necessary for immediate effect. But in a few years when the upper surface became crop-sick, it would be turned under again,—and so on, *ad infinitum*, as the years rolled by. Under this treatment celery flourished beyond almost any other vegetable. It was planted in deep trenches that would hold water, and permitted of abundant earth for blanching with facility. Old World gardeners tell fabulous stories of the many score of pounds a stalk would weigh,—and most of it as soft, tender and crisp as an almond kernel. But in these days this is regarded as too much labor. The plough is the great garden implement, and as deep as the plough can go is regarded as the perfection of culture. Even if spade-fork culture has to be depended on few care to go further than a good plough-depth. The best celery stock now-a-days is rarely thicker than a delicate lady's arm. But it is still regarded as just the thing to make shallow trenches, though they are rarely more than four inches deep. The manure is concentrated therein after the celery plants are set out.

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THE AMERICAN PLUM.—The native plum has braved the severest of winters in western Canada, and fruit growers are endeavoring to get a race of good garden fruits from them by selecting the best varieties, and again selecting the best from the seedlings.

THE APPLE IN MANITOBA.—The apple succeeds very well in Eastern Canada. Canada apples compete successfully with American in European markets. But Mr. S. A. Bedford reports that no variety succeeds in Manitoba. They are all killed to the snow line. Even the usually extra hardy Siberian crabs succumb.

GROWING TOMATOES UNDER DIFFICULTIES.—In localities where the summers are short or the summer temperature low, it is difficult to get tomatoes to mature much of a crop. They are often trained up against the south side of walls or buildings, and these do fairly well. Mr. Samuel B. Green, of the University of Minnesota, has good success by growing them in barrels which are placed in any warm sunny corner. This furnishes a hint also for those in city yards or other spots where ground is scarce. A barrel crowned with handsome ripe tomatoes would be a pretty sight as well as a useful object, With a photograph of a very successful barrel-grown plant Mr. Green has the following description :

In the case photographed these plants were grown in an old sugar barrel in the bottom of which was a foot of well-rotted horse manure. The plants were trained up the south side of a building. When plants are grown in this way they should be near the house so they may be properly cared for as in dry weather they need much water. Treated thus, the plants have good chances of growing and ripening their fruit even in very unfavorable years and in very unfavorable locations. The soil in the barrel warms up quickly in the spring and when placed against the south side of a building the plants have the most favorable conditions for ripening their fruit. The barrel should have plenty of holes in it for drainage. Several barrels so treated will furnish quite a supply of tomatoes.

ROOT PARASITES,—EEL-WORMS.—The proceedings and reports of societies have not the usefulness they once had, because the numerous magazines and periodicals appearing so promptly and regularly bring before the people about all they desire to know. This limits considerably the readers of "proceedings." In many respects this is to be regretted, as they often contain articles of value deserving of the widest perusal. We have occasionally referred to the proceedings of the Columbus Horticultural Society as especially one of this valuable class. There is scarcely an issue that does not contain some paper that deserves general attention. In No. 10 of Vol. 4 just issued, among others is one on vegetable pathology by Aug. D. Selby. The section on "nematodes in the greenhouse" deals with those little root-galls, caused by "Eel-worms," as the nematode is popularly termed. These galls appear like grains of wheat or rye on the roots. Cutting them across, and examining them with a pocket lens, it can readily be determined that they are of insect origin.

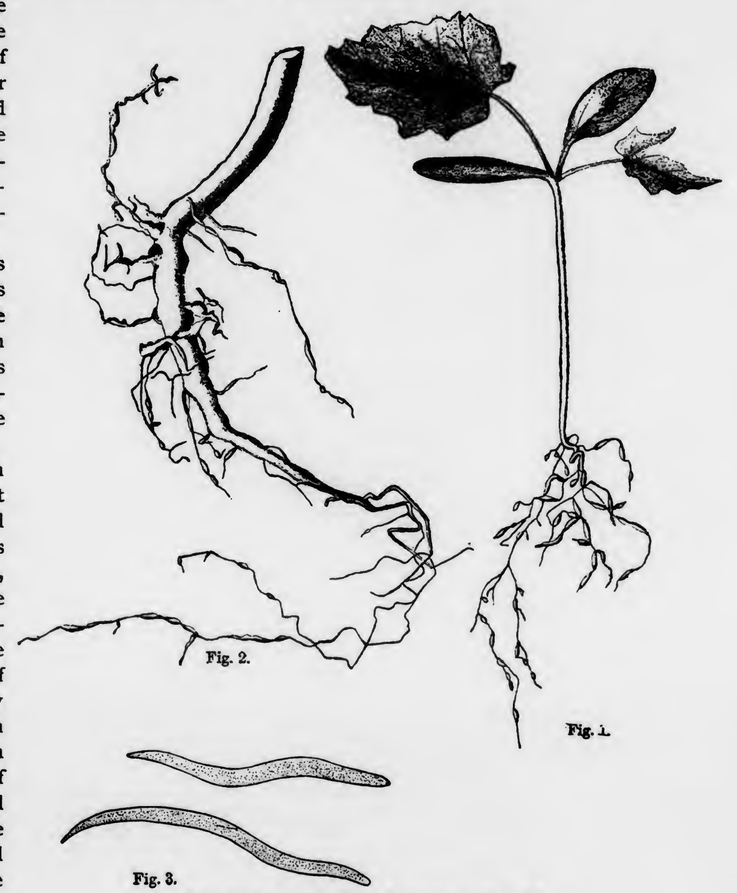
As a specimen of the value of the *Proceedings* as well as for the value of the chapter itself to our readers, we have transferred an account of the eel-worms and their mischievous operations.

The observed injuries of greenhouse plants ascribed to the root parasitism of nematodes or eel-worms have been considerable. These parasitic worms have been found upon roots of abutilons, roses, begonias, tomatoes, violets, cucumbers, and adventive plants in the greenhouse, as burdock, etc. The nematode trouble is now a very serious one in greenhouse culture. Many rose growers have complained of yellowing of rose plants under glass, and also of the sudden leaf dropping, wilting and collapse of roses. These symptoms, with stunted growth, unfruitfulness and serious loss of plants, have been met at the greenhouses of this Station, as elsewhere. With us they have been traced to nematodes. The leaf symptoms of the nematode disease are usually diagnostic. Aside from the 'yellows' aspect on the more thrifty rose plants, the leaves die off with special characteristics : there is dying from the tip and margins of the leaf toward the petiole, and leaves thus dying have a scalded appearance. In cases of nematode attack, the rootlets will, if examined, show the small excrescences upon them caused by the nematodes. This root examination will give final evidence. The enlargements due to nematodes are quite small but fairly clear, and when examined under the microscope show the minute worms, nematodes, or their eggs, or both.

Cucumbers in a forcing-house at Hyde Park, Hamilton county, showed in early winter an extreme case of nematode injury. The roots of even small cucumber plants were beaded with the nematode galls, in some surprisingly like a necklace in form and appearance.

The illustrations show the nematodes and their work. The plants attacked soon perish. The losses caused by the parasites are liable to be severe.

Upon begonias both roots and stems (at crown) were found attacked ; on violets the roots were affected, and the same is true of tomatoes and abutilons. In all of the plants named, the leaf symptoms, notably dying from margin toward petiole, with general evidences of mal-nutrition, stunted growth, etc., were usually quite marked in connection with the nematode galls upon roots and stems



EEL-WORMS ON ROOTS OF CUCUMBERS.

Precautionary measures in fitting and selecting earth and manure for the benches seems most promising for nematode troubles. The soil or sod for soil which, with the manure, appears to provide them, should be cut early, watered in pile if necessary, to secure prompt decomposition, and then so handled in winter by cutting down, two-winter exposure, or otherwise, as to secure thorough freezing and disintegration of the soil. The freezing, it is thought, is our chief reliance for prevention, but Prof. W. J. Green has suggested the use of steam for treatment to destroy the eel-worms and their eggs. The nematode problem has become one of the pressing ones for the greenhouse culturist.

Fig. 1. Small seedling cucumber plant, with the nematode galls upon rootlets. Natural size.

Fig. 2. Root of a full-grown plant similarly affected. Natural size.

Fig. 3. Two nematodes or eel-worms, magnified 130 diameters.

Drawings by Miss F. Detmers.

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BIOGRAPHY AND LITERATURE.

THE LUCKY CHANCE.

As exhalations, when they burst
From the warm earth, if chill'd at first,
If check'd in soaring from the plain,
Darken to fogs and sink again:
But, if they once triumphant spread
Their wings above the mountain-head
Become enthron'd in upper air,
And turn to sun-bright glories there.

—THOMAS MOORE.

THE SPRAYING OF PLANTS.—By E. G. Lodeman, New York, McMillan & Co. This little book gives an account of the history, principles and practice of the application of liquids and powders to plants for the purpose of destroying insects and funguses. Such a handbook is essential in these times, when it is almost impossible to garden successfully without some knowledge of these things.

EARLY HISTORY OF THE OSAGE ORANGE.—Nuttall tells us in the Supplement to Michaux's Trees of North America, that the Osage Orange, which he named Maclura, in honor of William Maclure, the chief founder of the Academy of Natural Sciences of Philadelphia, "was first noticed by Hunter and Dunbar, in their voyage up the Red River, on the banks of the Little Missouri of the Washita River, also near Natchitoches, and upon the banks of the Arkansa. It was likewise observed by Dr. James, in Major Long's expedition along the banks of the Arkansa and the Canadian. I first saw living plants bearing fruit, about the year 1810, in the garden of Mr. Chouteau, at St. Louis, from seeds collected in the country of the Osages. It was afterwards introduced into the garden of the late Mr. McMahon, from seeds collected by Governor Lewis."

It so happens that the writer has had the opportunity of examining the collection of plants brought home by Lewis and Clark, in their famous expedition across the continent, and which package has not evidently been opened since they were examined by the celebrated Pursh; and, though many are completely devoured by the herbarium beetle, there is a specimen of the Osage Orange among them, uninjured, without leaves or flowers. Pursh could evidently make nothing of it, and passed it over. But from the whole history, as here developed, the first discovery of the Osage Orange should be credited to the Lewis and Clark expedition.

FLORAL POETRY.—A Philadelphia correspondent says, with some justice:—"I have never been an ardent admirer of Whitcomb-Riley's poetry. His chief merit consists in a twisting and torturing of the English language into horrible forms, that, even as "dialects" never had substantial existence. The quotation by Mr. Williams at page 86, is not hacked in the language employed, as Riley usually loves to display,—but the imagery is too absurd to be offered as genuine poetry. Who would want to hold a "molten lump of gold" between his "thumb and finger tips," much less "pour" out of his "finger tips" the red-hot mass of molten metal "through his lips." In comparison with the really choice bits of floral poetry given by the editors from month to month, this May-apple piece of Riley's seems more than commonly absurd.

THE WATER WITCH.—The following clipping from an English paper looks as though the Witch Hazel had some friends yet, does it not?

"WELL-SINKING.—J. J. GREEN, Water Finder, will be pleased to wait upon persons desirous of finding a Spring before digging or boring. Will with his Rod point out the Exact Spot, saving expense. Will send circular for penny stamp. Terms moderate; good references.—Cheddar, Somerset."

Philadelphia. C. F. SAUNDERS.

THE ELM-LEAF BEETLE.—Professor Howard believes that the beetle which has been found skeletonizing the leaves of *Scutellaria Veosicolor*, is not the true Elm-leaf beetle of entomological literature. Should any one note such an insect feeding on this species of *Scutellaria* Mr. Howard would be glad to have it.

DR. JOSEPH T. ROTHROCK.—Few of the younger race of botanists are better known than Dr. Joseph T. Rothrock. Dr. Asa Gray regarded him as one of his most promising students, and results have fully justified this early estimation. His love for botany was so marked, that when in his 23rd year he enlisted as Captain in the 20th Regiment Pennsylvania Cavalry, he did not think his preparations for the war completed until he had placed a copy of Gray's Manual of Botany in his saddle bag. He was shot through the thigh in the battle of Fredericksburg. Returning from the war he resumed his studies and graduated from the Scientific Department of Harvard, and subsequently as M. D. from the University of Pennsylvania; in which Institution he became subsequently Professor of Natural History. He joined the party exploring for a telegraph route through Alaska, and subsequently published a Flora of that territory. In 1873, he was appointed surgeon and botanist to the Wheeler exploring expedition, subsequently preparing the volume on the botany of that expedition. Since 1893 he has been Forestry Commissioner of the State of Pennsylvania, and devotes most of his time in studying matters on the spot. Born at McVeytown in 1839, there is every reason to hope that in the natural order of things, Dr. Rothrock has really but entered on the field of usefulness, for all the good work his knowledge and enthusiasm has already accomplished. The cut is from one in the possession of Mr. John Gifford, of May's Landing, New Jersey, a good co-worker with Dr. Rothrock in the advancement of forestry.

DR. JOSEPH T. ROTHROCK.

THE COLUMBINE ASSOCIATION.—Under the title of Columbine Association, a society has been formed in Boston, the object of which is to secure a general recognition of the columbine as a National emblem.

PRANG'S EASTER CHROMO'S AND THE HARRIS LILY.—Those who enjoy the beautiful pictures prepared for MEEHANS' MONTHLY by L. Prang & Company, were not surprised at the matchless art developed by their Easter cards. The Harris Lily found a prominent place in the designs, and the remark make in their circular that this is pre-eminently an American florist's flower, reminds one of the remarkable career of this variety of Lily. It is not so many years since Mr. W. K. Harris, a prominent florist of Philadelphia, sent a single blossom to the monthly exhibition of the Germantown Horticultural Society. It's Professor of Botany, Thomas Meehan, made a practice of giving an extemporaneous address on the articles exhibited at these meetings. He explained that this huge lily was only a monstrous variety of the well-known Japan Lily, *Lilium longiflorum*, but well worthy of variatal distinction. He named it Lilium longiflorum Harrisii. Its progress since has been phenomenal. The seventeen florists of Philadelphia sold on Easter day Harris lilies, to the extent of thirteen thousand dollars. The history teaches the lesson that the one who knows a good thing when he sees it is more entitled to reward than the ignoramus who is in first possession. The Bermudians were in utter ignorance of the value of that of which they had abundance. That they have made fortunes out of it is due to the wisdom of Mr. Harris solely.

LEAF-CHARTS.—Miss Lewis, of Media, Pa., has issued No. 3 of her illustrations of leaves and fruits, for the use of nature—teaching in the public schools. The oaks are continued,—and this time rendered particularly valuable through having the leaves of some fossil species in the collection. They are models of accuracy, as well as fine specimens of drawing.

PHOTOCOPY OF ORIGINAL

GENERAL NOTES.

THE MANNA OF THE OLD TESTAMENT.—A Long Island correspondent, desires information as to what was the Manna of the Old Testament and sends the following from the *Christian at Work*:

"On the first Sunday in June the Sunday schools consider the subject of the supply of manna. It has been a question upon which commentators have differed—and upon what questions have they not differed?—as to whether a relation exists between the natural manna—the Egyptian *mannu*, being the exudation of the *Tamarix mannifera*—and the spiritual manna [Exodus xvi. et seq.] The Schaff-Herzog Encyclopedia says: 'The sweetish exudation of the tamarisk has nothing to do with the bread furnished by the Lord to the Israelites.' Smith's Bible Dictionary also says: 'The manna of Scripture we regard as wholly marvellous and not in any respect a product of nature.' Both these expressions are very positive; but Professor Franz Delitzsch thinks differently, holding that the gift of the quails and the gift of the manna are certainly correlated in our Biblical narrative. No one supposes the quails to have been specially created birds, but such as have been noted in Algeria, where acres of ground have been found covered with them at daybreak where there were none the night before. So it is claimed by Dr. Delitzsch the manna is the ordinary tamarisk juice, of which the Bedouins speak as 'raining from heaven,' because 'it falls from the trees like the dew.' Of course the subject is purely speculative; still it enters into a distinctive school of thought of to-day—that which draws upon the miraculous to that extent only in which the supernatural is necessary. In this view the same interpretation would be given to the manna as to the quail miracle, the supernaturalness being placed upon the miraculous abundance of the supply, and not upon the article of food"

It should be sufficient to say that no explanation based on natural phenomena, has ever been given. It must not be forgotten that the occurrence was on a desert where no trees grew, and though it is possible that a few scrubby specimens of the Tamarix might be found here and there, the salty stuff it exudes called Jews' manna, would have been found every day, and there could be nothing miraculous on its appearance at the particular occasion cited. There is absolutely nothing growing on that great desert that could furnish the article described. It is given to us as an absolute miracle,—and it could just as well have been accomplished in the shape of some absolutely new farinaceous compound. Indeed the miracle would have been just as perfect if the Jews had been enabled to live for forty days without food at all. When things are given to us as miracles, what is gained by explaining them away? The *Christian at Work* should know better.

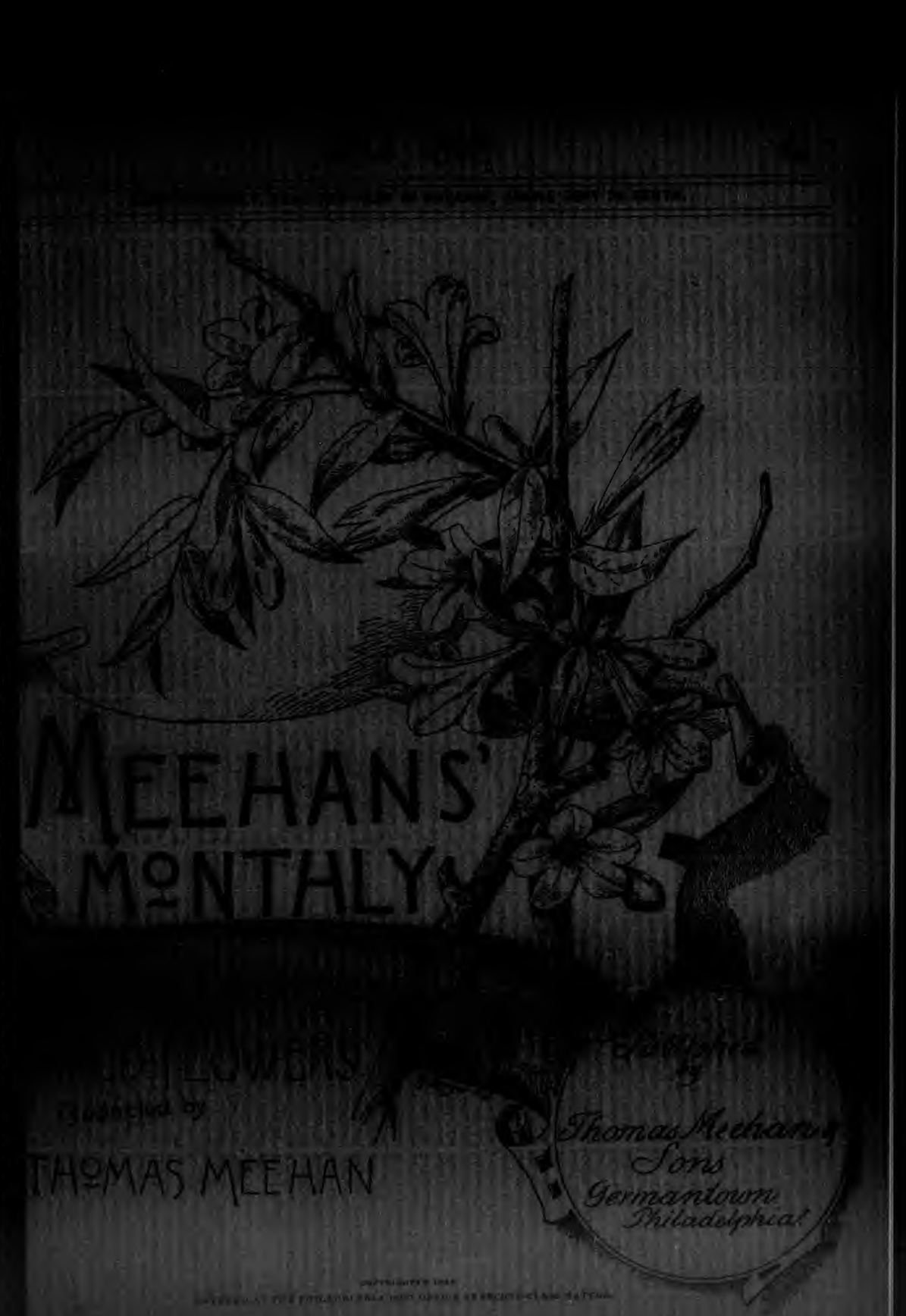
Manna, as we know it, is the sap of an Ash tree, *Fraxinus Ornus*. This does not grow in Palestine.

WHITE PINE FOREST IN NEW JERSEY.—Are you dead sure that your illustration in April issue of MEEHANS' MONTHLY is of *white* pine? My observation or rather my shadowy memory makes me think it is another specie,—probably *Pinus rigida*, about the hardest tree we have for fire to harm. I am not here calling in question your principle, but your facts—and possibly you may be right. At any rate it would be well to ascertain, for that trunk in the foreground has a dreadfully *rigid-like* look to me.

J. T. ROTHROCK.

West Chester, Pa.

Dr. Rothrock is undoubtedly correct, as the prominent figure in the foreground clearly proves. It is rare that such extra fine specimens of *Pinus rigida* are seen in New Jersey in these days. The principle which the picture was intended to illustrate, namely the safety from fire which the absence of dead underbrush insures, remains unassailed by the change of name. Flaming forest now, are proclaiming against dead underbrush.



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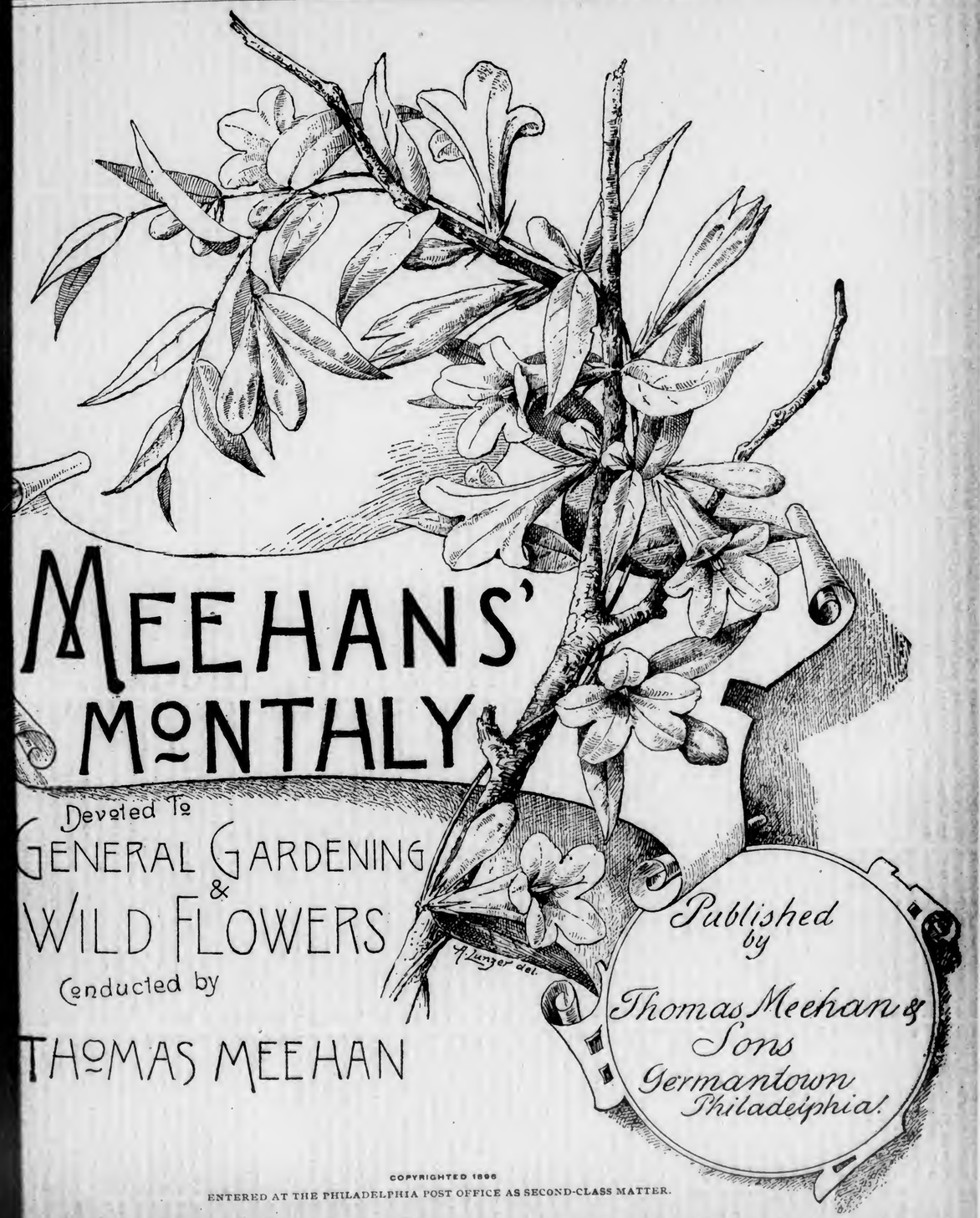

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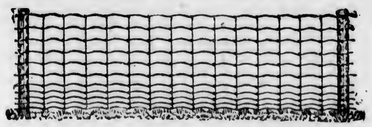

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ASPIDIUM GOLDIANUM.

GOLDIE'S SHIELD-FERN.

NATURAL ORDER, FILICES.

ASPIDIUM GOLDIANUM, Hooker.—Frond broadly ovate, or the fertile ovate-oblong in outline, two to three feet long,—pinnæ (six to nine inches long) oblong-lanceolate, broadest in the middle, pinnately parted; the divisions (about twenty pairs) oblong linear, slightly scythe-shaped (nine to fifteen lines long), serrate with oppressed teeth; veins pinnately forking, and bearing the fruit dots very near the mid-vein; indusium very large, orbicular with a deep narrow sinus, smooth and without marginal glands. (Gray's *Manual of the Botany of the Northern United States*, and Wood's *Class-Book of Botany*.)

The beautiful fern here illustrated is not recorded as found in Eastern Pennsylvania,—though there is a specimen in the Herbarium of the Academy of Natural Sciences of Philadelphia, ticketed in Nuttall's handwriting as having been collected at the Falls of Schuylkill,—and an acute botanist of Germantown, Mr. Wm. Wynne Wister, reports that in his younger days it was abundant in a meadow near that old borough, which is now built over. The specimen for our illustration was collected along the Wissahickon—a famous locality for rare plants. It differs in some slight respects from forms that have been illustrated and described as *Aspidium Goldianum* by some authors, especially in having the fronds narrower in outline, and the rachis rather more chaffy than often seen,—but in this respect it rather favors an original specimen of Goldie and the one cited of Nuttall preserved in the herbarium of the Philadelphia Academy. Some collected by Dr. Southwell in New York, in the same collection, and marked especially "typical," agree more closely with ours than with the illustrations referred to. It is well to note these differences, because they teach that in determining the species of ferns no great dependence can be placed on a single character. The best single point would be the presence of the fruit dots near the mid-rib in connection with a frond reminding one of *Aspidium marginale*. One might indeed almost say that *Aspidium Goldianum* is *Aspidium marginale* with the fruit dots along the mid-vein instead of on the margin.

The species was first discovered by John Goldie, a well educated Scotch gardener, who collected in Canada and along the Lakes in the early part of the century. It had indeed been known before, but had been classed with *Aspidium Filix-mas*. Under its present name it was described in "A description of new or rare plants discovered in Canada in 1819, by John Goldie" published in 1822, in the *Edinburg Philosophical Journal*. Almost all that is known of Goldie by American botanists is in connection with this fern, and it is rare to find anyone who knows aught of his history. He gives the following account of his journeying in America as an introduction to the paper above cited. He long had a desire to visit America, but was too poor. At length in 1817, "I contrived to obtain as much money as would just pay my passage there, leaving, when this was done, but a small surplus." He landed at Halifax where he "saw *Sarracenia purpurea* with yellow flowers." After collecting for a short time he went to Quebec. He packed all his collections and placed them on a vessel bound for Greenock, but never heard of them afterwards. From thence he went to Montreal and met Frederick Pursh, author of the North American Flora, "who advised me to turn my course northwest the following spring, and promised to secure me permission to accompany the traders leaving Montreal. I walked all the way to Albany, then went by water to New York." From this as a centre he explored the eastern part of New Jersey, which gave him "more gratification than any part of America I had seen." At Quaker Bridge "I gathered some most interesting plants, and with as large a load as my back would carry, I took my journey for Philadelphia where I staid a short time." Then he went to New York and again placed his treasures on board of a vessel for Scotland, and again "never heard of them after." He tramped along the Mohawk River, but at length found himself absolutely penniless,

ASPIDIUM GOLDIANUM.

GOLDIE'S SHIELD-FERN.

NATURAL ORDER, FILICES.

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INTENTIONAL SECOND EXPOSURE
TEXT CUT OFF

but then started as a "schoolmaster" in which capacity he struggled through the winter. When the winter broke up in 1818 he tramped off for Montreal, only to find that Pursh had left for Quebec, "and I found that even if he had been present his interest would scarce have been sufficient to have obtained for me the assistance and protection I desired." Again penniless "my only alternative was the spade, at which I worked all summer, reserving two days a week to make collections. The only excursion I was able to take was a little way up the Ottawa or Grand River." In the autumn he again shipped his plants "but the vessel was subsequently totally wrecked in the St. Lawrence." To live during the ensuing winter he "designed some flower pieces" from which he obtained "a trifle." With the spade in spring, he managed to save $50 by June, and found a friend to lend him fifty more. This was riches; and he started for the grand tour,—to Kingston, New York, Lake Sincoe, back to New York, Niagara, Fort Erie, over to the United States, ninety miles along Lake Erie, to Pittsburg, returning along the side of the Allegheny River to Point Orlean, to salt works of Onondaga, to Sackett's Harbor, to Kingston, where he packed up his whole collection, carried it to Montreal, and then this time went with his collections to Greenock, and this time reached safely home. He sadly writes that this package was all he had for three years' labor,—but he bravely adds that "in spite of ill fortune I will go again in spring." Whether or not fortune ceased to frown on him from that time the author has not been able to determine. Brittin's biography briefly notes that "John Goldie was born at Maybole, Ayrshire, in Scotland, in 1793, and died at Ayr, Waterloo County, New York, United States, in June, 1886. He was the discoverer of *Rumex aquaticus*." It is at least a gratification to know that in spite of the early frowns, fate so far relented as to extend his days to near the century mark.

When the law which determines how one species is evolved from another shall be definitely determined, it will be seen that a slight variation in the direction of life energy makes all the difference between *Aspidium marginale* and *Aspidium Goldianum*. The forking of the veins—a character which the student of ferns pays close attention to—is exactly on the same plan in both. The fruit dot is on the apex of the lowest branch of the forking veins in both species. But in *Aspidium marginale* the veinlet is extended to the margin, while in *Aspidium Goldianum* the growth energy rested almost as soon as the veinlets started. One might almost say in the one case the fruit dot was sessile, and in the other pedunculate. The other characters have had to follow this primary leadership in giving the characters which distinguish the two species.

The geographical range is given by Eaton as "Canada and Maine to Indiana, Virginia, and Kentucky." It does not appear to be abundant in any one locality, but has possibly been overlooked in many places on account of the broader fronded form being looked for, or in the mind of the collector. A writer on the elevations at which ferns are found, in an interesting sketch in the "Bulletin of the Torrey Club" has seen specimens from Owen Sound, Mount Mansfield, Mantastignet, N. H., Cheshire, Conn., Bongoon's Gap in the Pennsylvania Alleghenies, Madison, Ohio, Peaks of Otter Virginia, and Laurel County, Kentucky.

Gradations may be found between *Aspidium marginale*, *Aspidium cristatum* and our present species, *Aspidium Goldianum*; and it is more than probable that they are all derived from one parent form. It is often held, when such close relation exists, that the several forms are hybrids, or else mere variations not deserving of separate specific names. The practice then is to drop or make synonyms of all but the original. But classification is for aid in study and it is more useful to keep widely different things distinct, even if their boundaries be not clearly defined, than to unite many striking points under one denomination. And this may be sound, though we actually knew that one distinct form was derived in our own time from another. No matter how closely these three ferns would seem to run together at times, botanical study is served by keeping them under their distinctive names. Color is not often taken into account when marking the differences between species, though it is in many cases a constant character. This fern can be well distinguished by a brighter green.

EXPLANATION OF THE PLATE.—1. A full-sized frond from the rocky hills of the Wissahickon, Phila. 2. Outline of a scarcely matured frond. 3. Undersurface of pinnule showing veins and position of the fruit dots.

WILD FLOWERS AND NATURE.

A SUMMER SCENE.

It was a sultry day of summer-time,
The sun pour'd down upon the ripen'd grain
With quivering heat, and the suspended leaves
Hung motionless. The cattle on the hills
Stood still, and the divided flock were all
Laying their nostrils to the cooling roots,
And the sky look'd like silver, and it seem'd
As if the air had fainted, and the pulse
Of nature had run down, and ceased to beat.

—N. P. WILLIS.

POISONOUS HONEY.—The subject of honey ever being poisonous has long interested the writer with a desire to know what are the facts and not theories. Myself and some of my family having been made sick, as well as many of our neighbors, soon after eating poisoned honey, the symptoms being invariably the same—vertigo, blindness and sickness (remedy: drinking milk freely or taking mustard as an emetic) makes it an established fact. Then, too, in certain places on Long Island, where the *Andromeda Mariana* is not known to grow, these cases are not known, giving a reason for attributing it to this plant. Some thousand acres on the Hempstead plains are covered with it, and it is noticed that if there has been a plenty of flowers, very rarely are there any cases of poisonous honey. Honey containing this poison gives a sharp taste in the mouth, and the experienced can detect it by its color. Often but a few cells are poisoned, and one may eat from a comb with impunity until the sharp taste and burning sensation gives warning, and the effect is easily counteracted by drinking milk as stated. It is not known that it has proved fatal,—even to the bees, but with some persons it nearly has.

The member of the Solebury Farmers' Club is correct in stating that many apiaries have been abandoned on account of the danger in honey made in the vicinity of the Hempstead Plains. Now what shall we attribute it to? Some years ago, I saw in a paper that a Philadelphia chemist had examined some honey of the *Andromeda Mariana*,—called Kill-calf, because sheep eating of the leaves had the same symptoms,—and the result was that prussic acid was found in it. Now, if any of the army of Xerxes, or even my friend Meehan, had unfortunately experienced its effects, as so many have in this portion of Long Island, the verdict would not long be in suspense. Horses will eat the *Rhus toxicodendron*; and there are many proofs that what is injurious to one is not to all. I am sorry to give such a bad name to Kill-calf or Staggerbush, for it is a beauty. Does this statement amount to proof? My old friend Meehan had better eat mince pie, for I should be sorry to have him suffer as my son did last summer after eating poisoned honey. ISAAC HICKS.

Westbury, L. I.

The difficult part of the question has always been in the certainty of the fact that honey capable of killing a man would certainly kill the bee. And it seems contrary to the usual order of things in nature that bees should collect and store for themselves and progeny that which would wipe out the whole race of bees in a neighborhood in the course of time. If it should be really proved in the cases of sickness cited that it was truly the honey which was really of a poisonous character as to produce the disastrous results, it would seem more reasonable to suppose that there was some chemical change in the honey after it was collected by the bee. There ought to be some way of solving these topics of such immense importance to humanity without guessing at them,—and this is the chief reason MEEHANS' MONTHLY loves to introduce them.

A LARGE RED OAK.—In a forest of Pemiscot County, Missouri, is a red oak which has recently been measured by Gol. George B. Bowles of Affton, St. Louis Co., which has a trunk of 27 feet in circumference near the ground, and 19 feet, at 8 feet from the ground. The straight trunk is 60 feet to the first limb.

Is there a larger oak tree of any species anywhere? The white oak has usually the largest specimens.

THE BITTERNUT HICKORY. — Occasional references have been made in MEEHANS' MONTHLY to variations in the Bitternut or Swamp Hickory. A couple of years ago, I made a careful study of the hickories of this vicinity, mainly for the purpose of finding *Carya porcina*, the Pignut, as I was not certain of its occurrence in our woods. With a view to this, trees were selected in various localities and marked so that the same tree might be visited as occasion required throughout the season. The work began in the spring, with the opening buds, and ended in autumn, with the fruit and winter buds. Those of the Bitternut kind particularly studied were seven in number, but comparisons were made with several more. Full descriptions were written of all of the trees selected, each being independently studied. No points were strained to make them match each other, or fit a published description. The species was to be left unnamed till the work was done, for in the effort to fit a description there lurks a temptation to suggest or find features which may not exist, or, at least, to "strain a point." On the completion of the work, the notes were all compared, together with a full set of specimens, and all proved to refer to one species, *Carya amara*, or *Hicoria minima* by the new nomenclature.

There was no feature constant throughout, but from the notes could have been compiled a description of the Bitternut which would be typical of the species as found in this vicinity. The least variable character was the terminal winter bud. It is considerably longer than the axillary buds, pointed, almost always curved, and rather conspicuous from its yellow or copper colored scales. Next were the segments of the calyx and the number of stamens, the former nearly always three, occasionally four, and the latter predominantly four, but sometimes five. In no case was a leaf taken that had more than nine leaflets, and rarely less than seven. In shape, they ranged from lanceolate to oblong-obovate. They graded from those that were long-pointed to those scarcely or but slightly pointed. The long-pointed lanceolate type prevailed. The most common nut was small, and depressed globose in form. Others were nearly twice as large, much elongated, and rather broader above the middle. The sutures of the husk were sometimes very prominent, running from the top nearly to the base, so as to make the edges of the valves winged, while in others they nearly disappeared, and the husk was almost smooth. The shells varied greatly in thickness, being sometimes so thin as to crush easily, while others needed a smart blow of a hammer to break them. Though the prevailing characteristic of the meat was bitterness, some of the nuts were quite edible, with no after taste of bitterness, and considerable testing was necessary to decide whether they should be considered palatable. Even the same tree bore those that were comparatively sweet along with the very bitter. The trunks in general had a close, smooth bark, but there were cases with exfoliating bark, it coming off in thin flakes so as to suggest a youngish tree of the Shell-bark Hickory. As this was observed in small trees, it did not seem due to age.

Though there were characters which varied towards other species of hickory, there were none that needed the hypothesis of hybridity to explain them. It was not particularly difficult to interpret all as blonging to *Carya amara*, however they might vary. None of the trees grew in proper swampy land, some are in river valleys, mostly where not subject to overflow; but they are common throughout on hills and in valleys, in soils of varying composition, but principally on clay land or soils mixed with clay loam. The Shell-bark is usually one of its companions, and I have yet to find an example of *Carya porcina*, which is said to occur here. E. J. HILL.

Chicago, Ill.

Prof. Hill's paper is a contribution to vegetable biology of more value than the modesty of the author would be willing to acknowledge. The old idea that every species of plant has retained all the characteristics it originally possessed,—and that new species can only originate under the accident of new external conditions of which hybridity is one, is weakening,—and the plant's own varying degree of internal energy given credit for many of these charges. As Mr. Hill shows in this instance the accident of hybridity has nothing to do with the striking variations in the Bitternut.

DEATH FROM FREEZING.—In one of your Monthlies, sometime since, I noticed your saying something like this about strawberries, "They are not injured by frost, but by the sun." Now I claim that this law must apply to *all* vegetables, also to all animal life. Death comes at the transition between the cold and heat.

I have read of animals as large as woodchucks being frozen solid, brought to the woodshed for meat for the poultry, but, when the warm days of spring came, some of them were found alive.

Some thirty years ago, I remember of asking a post-master (a man well posted) if he had ever read or heard of the idea that frost killed nothing, he said "no,"—I told him my views, and that I thought of writing an article on the subject, but then I thought the view would be so novel and new and absurd that I concluded to keep silent.

Occasionally I come across something confirming me in my opinion.

The following extract I take from a paper. "Gruselbach, a German savant, has been devoting a considerable time to perfecting an apparatus to freeze living people and keep them in a torpid condition for a year or two. He has submitted his invention to the Swedish Government, with a request that a criminal condemned to death shall be provided to enable him to demonstrate the efficacy of his discovery. He is professor of chemical science in the University of Upsala, and those who are anxious to take a long rest should keep his address in mind."

With my view of the subject, I view with horror the burial of those persons who are frozen with their life still in them (only *suspended*), ready to be rususcitated when suitable conditions are applied.

Who knows but the low temperature of the soil may be suitable conditions for recovery,—and then to think of the horrible death to follow.

I have observed, in my life, among others, two very singular, natural curiosities. I will relate them to you.

When I was younger than now, I was accustomed to cut our wood 8 or 10 feet long, in the fall, skid them in piles and then, when sledding time came, draw the wood home.

That fall and early winter was mild, rainy and open, so that when I come to drawing the log-piles I found the logs were frozen together.

There was one large cake or chunck of ice between two logs, and in this chunck—in the center, the form or picture of a very small evergreen tree, about an inch or a little more, tall with beautiful proportions in *stem*, *branches*, *limbs* and *twigs*.

I carried it to our village and showed it to various ones, including the teachers of our seminary, but no one could tell whether it was a *tree* or not.

Soon the ice began to melt. I thought I would find out whether or no it was a veritable *tree* or not, so I took my jack-knife and shaved it up little by little,—and I found no tree; but the body and *all* I found to be hollow,—a vacancy,—a vacuum.

Who can explain?

The second curiosity: One cold, frosty morning in the fall, I found, on one of my back windows, a peculiar frosting,—a perfect imitation of a circular spider's web, with all the inner circles, with all the cross-bars, and in fact a frost web.

I am not Geometrician enough to explain it, so that if you are unacquainted with these webs you may not fully understand me.

But the most singular thing about it is to come; it was repeated the next morning, in the same spot. TIMOTHY WHEELER.

Moscow, Vt.

POISONOUS HONEY.—A Germantown correspondent writes: "Can you tell me if the pink Japan Judas tree, which was in bloom a couple weeks ago, emits a fluid poisonous to bees and other insects? I have seen it stated that such was the case. That insects were attracted by the bright blossoms, but that the latter emited an opiate and the dead insects could be seen on the ground about the bush."

Dead bees can be found in abundance under any early flowering plant that they frequent. It is not that they are poisoned; but simply that their time has come. The life of any bee does not reach twelve months.

ASTERS AND GOLDEN RODS.—The botanist can scarcely describe the botanical difference between the Asters and the Golden rods, for with a few whitish exceptions, the Golden rods are always yellow.

How Humble-bees Obtain Honey from Flowers.—I have read with much interest the accounts given, on this subject, at pages 3 and 63 of this volume of the Monthly. During the last twenty or more summers I have annually and repeatedly watched the mode of insect-visitations to flowers; especially the mutilation of flowers by insects. At first I thought I had observed bumble-bees slit the tubes of the corollas of a number of plants, and so reported in the *Botanical Gazette*, but afterwards corrected this statement. By more careful study of these insects I learned that the real humble-bee (*Bombus*) seldom if ever slits the corolla tube to obtain honey. *Bombus pennsylvanicus* and *B. americanorum* are common with us, and so far as my observation goes, they invariably have taken the honey through the mouth of the flower. The insect which I have found doing such depredations is not really a humble-bee, but the carpenter-bee, (*Xylocopa*). I never have seen this insect enter the embrasure of a flower; yet it is a frequent visitor for honey. In my observations it has always slit the corolla at the point where the nectar was situated. In larkspurs and columbines the slit was made at the end of the spur. Nor does it try to find a slit made at a former visit, but as soon as it finds the proper place it at once sends its sharp beak through and takes the honey. I have observed *Xylocopa Virginica*, the Virginia carpenter-bee, take honey in this manner from *Physostegia Virginiana*, *Mertensia Virginica*, *Pentstemon pubescens*, *P. lævigatus*, *Pontederia cordata*, *Astragalus Canadensis*, *Trifolium pratense*, *Aquilegia Canadensis*, *Delphinium tricorne* and *D. palmifolia*.

After these slits have been made a number of the small bees take honey through them also.

J. Schneck.

Mt. Carmel, Ill.

Effect of the Season on Plant Growth.—A correspondent in Southern Maryland says:—"Brant says his cherry trees were loaded with 'blooms.' There are but few cherries. I note that generally each flower has from one to three leaves coming out of it. The pistil or stamen has gone back. This is probably the direct cause of the crop failure. But why have these leaves appeared?

I frequently remarked last summer to my friends that I thought the bud could not possibly form on trees during a summer affected with such a *hot drouth* as last year's. The tree could not in my opinion do its duty with such a lack of one essential and such an excess of the other.

This spring the prediction appears to be coming true. With no great cold during winter and no unseasonable weather this spring the fruit crop is exceedingly irregular, and the irregularity is going more and more against a full crop which latter everybody expected at the blooming season.

All crops are deteriorating as to *quantity*, as the season advances. It is to be hoped that what is left will be better than usual."

The specimens sent were very interesting from a morphological point of view. The flower buds—for they were what nature had evidently set out to make as flower buds—produced small leaves only. In a few instances, however, short pedicels with ovariums and calyx-lobes were projected, but in place of the fine white petals of the cherry flower, were five small green leaves,—rather they were geeen for a short time, but were as yellow as an autumn leaf at the stage examined. The pretty serratures of the cherry leaf were present. Other instances of the influence of environment on changing the character of plants have been numerous. How far these changes may operate in a permanent way is another question.

Rose Colored May Apple.—In one of my botanical excursions this spring, I met with several odd specimens of the May Apple, *Podophyllum peltatum*. The first I met with comprised a bed of these beautiful herbs,—the petals of every flower were of a beautiful rose color instead of white, and the stigma and ovary a very dark purple instead of yellow. Otherwise it was the same as the regular May Apple. The other peculiarity of another specimen was the absence of leaves, the stalk very short, all the parts of the flower double, and the flower large. I measured one of them, which was a little over three inches.

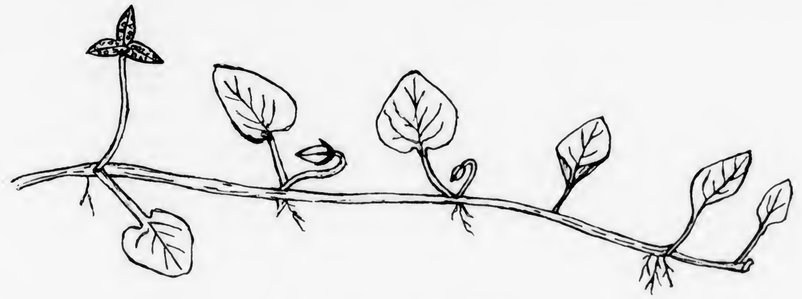
H. P. Beaver.

Greenville, Pa.

The Poison Vine.—How the poison Sumack *Rhus toxicodendron*, manages its venomous action, is still a profound mystery. People brush against it, or handle it with impunity.

Fruits Without Flowers.—The cleistogamous flowers of the violet are among the interesting things about these plants and the impression seems to prevail that these alone are fruitful. However this may be with other species, it is not true with regard to the sweet white violet, *V. blanda*, which fruits, with me, abundantly from the showy flowers. But that this species is not without its cleistogamous flowers is shown by the accompanying drawing, which illustrates also the peculiar runners of this plant. The runners seem to be little known, but may be found plentifully on the plants about midsummer. The leaves of the runners conform to the manner of leaf arrangement on the caulescent species, being alternate. In the axils of most of them are developed the cleistogamous flowers which bear full seed pods.

Willard N. Clute.



A CLEISTOGAMOUS VIOLET.

The whole subject of cleistogamy—that condition under which some plants can perfect seeds without making perfect flowers or opening the flower buds—is one of profound interest. It is an absolutely perfect arrangement of nature to secure self-fertilization. A very interesting point in connection with the violet is that in some cases only a single grain of pollen is at times produced, and yet a score of perfect seeds may follow this single pollination.

Draba verna.—It is remarkable how much there is to be seen that has never been seen before, even in the commonest plants. An enthusiastic young botanist in a note to the conductors says:—"May 10th, on a sloping hill side the first seed of the season is ripening,—the *Draba*. It bloomed early in April, on the second or third of those warm days we had, springing up by thousands, each rising as if by magic from the centre of a rosette of tiny root-leaves, mostly so handsome in the mustards, and covering sunny meadows with patches of webby lace."

It so happened that the writer of this paragraph noted the past spring that this common harbinger of spring did not expand its petals except in sunshine. There had been no sunshine for a long time, but from these closed flowers the growing capsules were maturing. They certainly had been self-fertilized in the bud and without the aid of insects. Looking further it was noted that the two "shorter" stamens were as long as the four "longer ones" as usually so termed, but that they were arcuate or bent inwardly, bringing the anther just over the stigma, and beautifully arranged for insuring self-fertilization.

Though the writer had been handling and dissecting this plant for between fifty and sixty years, this pretty behavior had never been observed before. It is annoying to reflect on how blind many of us are.

Habenaria orbiculata.—Mr. C. F. Saunders, Philadelphia, notes:—"In Hamilton County, N. Y., a not uncommon plant in the coniferous woods is *Habenaria orbiculata*. In local parlance it goes by the names of "Bear Ear" and "Heal-all," the former doubtless from its too large, flat, roundish leaves, and the latter because of the esteem in which it is held by the home doctors, who I was told by a man who had a number in his pocket, used the leaves to apply to burns, cuts, etc., one side to draw, and the other side to heal.

PECULIAR GROWTH OF ACORNS.—Mr. J. C. Whitten, Columbia, Missouri, asks:

"Can you tell me the species of oak that is said to plant its acorn by pushing a sprout down into the soil and transferring its matter below ground, where a new acorn is formed?"

This has reference to a paper from the pen of the Senior Conductor, referring to the manner in which the Live Oak, *Quercus virens*, pushes its radicle into the ground. That was many years ago, but the author, with a wider observation, has found that the acorn of this species of oak was only doing, on a wider plan, what all acorns were doing in a more or less degree. In most acorns, the cotyledons in germination have the power of rupturing the outer coating of the acorn, or of easily withdrawing them from the shell. In cases where this is difficult, the petioles of the cotyledons elongate, pushing before them the radicle with its plumule, which is thus led to a considerable distance from the acorn before the radicle turns to enter the ground. Sometimes these petioles will be almost united together, and appear like a perfect root, and this is the case in *Quercus virens*, when it seems strange to note the little bud from which the future tree is to ascend seeming to proceed adventitiously from the young rootlet. This is the method pursued in all monocotyledons, and suggested to the author the idea that probably the monocotyledon was the original type of all vegetation,—an idea that was vigorously opposed by Dr. Gray and others when the topic was broached,—Dr. Gray remarking, as it is recorded, that he would "leave to Mr. Meehan the task of re-constructing" botanical science on that basis. And this may be,—but yet the correspondences are surely interesting.

HUMBLE-BEES AND CLOVER.—Having called attention to the false theory of the bumble-bee fertilizing the red clover in my regular "Garden Notes" of the *Hartford Times* and you sir, as conductor of your highly valuable MEEHANS' MONTHLY, endorse my view of the case as correct, allow me kindly further a few explanatory remarks, concerning this erroneous matter, which should for the benefit of general education be taken cognizance of by the Department of Agriculture which no doubt by same of its publications fostered in a certain measure the distribution of this wrong idea.

Constantly re-occuring references in the daily press, and reported lectures by authors stating as positive, that since the importation of Bumble-bees into Australia, the people there were able to raise clover seed, which before their introduction had been an impossibility on account of the failure of fertilization by these sonorous insects.

I myself have blindly believed this Australian Bumble-bee stories, since even the government publication of "Insect Life" has articles referring to it printed in its issues.

See Volume IV., 1891, page 157, "The Bumble-bee in New Zealand." Also Volume VI., 1893, page 50, also page 133 by V. Riley, "the later successful introduction of bumble-bees to the latter country (New Zealand) to fertilize the red clover is well-known history." This will suffice at present and as the red clover is beginning to bloom, let us all who have an interest in it watch the doings and appearances of the bumble-bee. So far as my observation goes they have, since the late spring freeze of 1895, greatly diminished in numbers, and only the late fall of last year brought out a few solitary ones, at the time, when the dhalias were in bloom. But the real big and full [illegible] ones I missed entirely.

This spring some more are noticeable, but by no means the usual number as we see them in favorable seasons.

Those that are out can in no way affect the fertilization of the clover.

For the sake of American intelligence this matter ought to be authoratatively disposed of, to settle further references to it at once. I may also mention the fact that German bee keepers have long disregarded the clover as a profuse honey producing plant.

MRS. WILHELMINE SELIGER.

Hartford, Conn.

THE ODORS OF FLOWERS.—Many suppose that the odors of flowers come from the sweet secretions that the honey bee so fondly cherishes. This is true to some extent, and especially in flowers that have no petals and are yet sweet. But in a large number of instances the petals furnish the grateful fragrance. The rose and the carnation are familiar instances. There is not much sweetness to the rose after the petals have fallen. Honeysuckle fragrance precedes the nectar.

GENERAL GARDENING.

THE GARDEN AND THE WOODS.

——— the plants around
Feel the too potent fervors; the tall maize
Rolls up its long green leaves; the clover droops
Its tender foliage and declines its blooms.
But far in the fierce sunshine tower the hills,
With all their growth of woods, silent and stern,
As if the scorching heat and dazzling light
Were but an element they loved. Bright clouds,
Motionless pillars of the brazen heaven—
Their bases on the mountains—their white tops
Shining in the far ether—fire the air
With a reflected radiance, and make turn
The gazer's eye away.

—W. C. BRYANT.

INDIAN MOUND CORN.—I can add a little to the story of the "ancient corn" referred to on page 70.

About ten years ago a man by the name of John Cowle who was a "jack of all trades," and something of a wanderer—and who, part of the time, made his home in this neighbor-, brought from Arkansas and distributed among his acquaintances a small quantity of corn which he said was the product of some taken from an Indian mound the year before.

What I received was of a smoky color, the product of this was also of the same color—as I recollect—without exception; but the next crop showed many red ears, and the year following gave entirely red corn. About here I abandoned the variety.

My corn was isolated and therefore not likely to be affected by other kinds; moreover, I heard that the behavior was the same with all who planted it.

So the influence with me was—providing Mr. Cowle's story was correct—that the material which colored the corn had been nearly eliminated by time and the conditions under which it was stored. But the—to me, mysterious part was that no trace of the red showed in the first and second crops—that the coloring material could remain apparently dormant through two successive crops, and still be there. Perhaps botanists may explain this.

The corn grew to an unusual height and gave generally two or more ears to the stalk. There was more to the story—I have forgotten much of it, but I remember that some professor, a town or county officer, with Mr. Cowle, were present when the corn was exhumed.

This story antedates that of Mr. Stark, and if both are true may indicate a fixed custom with some ancient tribe or race of people, of depositing corn in the tombs of the dead.

This will perhaps be proved by future researches. I do not think the editor's reasoning good regarding the distinction of the thirteenth kernel, because, not only different ears of the same field of corn vary much in vitality but there is also a variation in the different parts of the same ear.

Kernels from the butt of an ear are not so likely to germinate as those from the middle. We may have a half, a quarter, or an eighth of a stand of corn, caused by poor seed.

BENJAMIN BUCHMAN.

Farmingdale, Ill.

GARDENING IN PULLMAN.—The town of Pullman, Illinois, was built wholly by the Pullman Palace Car Company, and its government is retained under the company's control. The houses for the operatives are built by the company, and the care of them with their surroundings are subject to the company's oversight. There are 1,750 of these cottages, and the court yards are under one superintendent who has a force of 30 men during the summer and 12 during the winter months to look after these affairs. The superintendent has to spend from three to five hours daily, in caring for methods, plans, and accounts in the office; and the remainder of the day, is given to actual supervision of the workmen's labors. The operatives are happy and contented, and it is a good illustration of beneficent "one-man power." A friend wonders why all municipalities might not be as beneficially governed? Unfortunately the "one-man power," when it does not happen to be beneficent, is an unbearably bad power, and for this reason communities have to put up with the moderately good, rather than risk the superlative on either side.

TILLANDSIA WILSONI.—Under the name of *Tillandsia Wilsoni* an illustration appeared in Vol. II, p. 180 MEEHANS' MONTHLY of a Florida air plant, which at that time, was supposed to have been hitherto undescribed in American botanical literature. Mr. Reasoner wrote that in his opinion it was only a young form of the well known *Tillandsia utriculata* of Linnæus. The plants have since developed so as to leave no doubt but that Mr. Reasoner, is right. Many botanists have been deceived before, as Schultz's *Tillandsia Nuttalliana* is also known now to be but a young condition of the same species, as also is *Tillandsia Bartrami* of Nuttall. The *T. stipulata* of Schultz is another form of the same thing, as also is Bartram's

TILLANDSIA WILSONI.

T. lingulata, the *T. polystachya* of Muhlenberg, and the *T. ramosa* of Sweet. This shows how the variations have confused the botanist.

The cut is reproduced with the correction here for another purpose also,—namely to emphasize the method of growing epiphytal plants. In their own countries they are found in situations where the air is saturated with moisture. Where one can have a regular orchid house this atmospheric moisture can be provided, and no such precaution is needed. But for those who have no such opportunity the planting of a block in a pot of earth is the next best thing. The block is kept moist,—the evaporation from the earth, helps to keep the atmosphere damp.

THE RED SPIDER.—In Eastern Pennsylvania and possibly many other portions of the United States, one of the greatest pests of the gardener is the red spider. It is not only an insidious enemy of the fruit-grower, but is equally troublesome with ornamental trees and flowers. Some evergreens, especially among the spruce family, suffer serious injury from them. Unfortunately the creature is so minute that few realize its existence till the foliage is noted as of a rusty brown color instead of the normal shade of green belonging to it. An examination with a pocket lens,—which, by the way, every good gardener should always have in his pocket—will disclose to view the little brown eggs, or even the insect with its webby productions—from which it takes its name, for it is not of the spider family. The Canadian Board of Agriculture gives the following as a mixture destructive of the insect when the bark of the apple tree is painted with it in the winter time. It ought to be equally valuable as a spraying mixture in the summer, as only the larger branches can be easily painted,—but applications of such mixtures should be always applied experimentally at first.

Kerosene	2 gallons
Soap	½ pound
Water	30 gallons

Boil the soap in ½ gallon of water, when boiling add the kerosene, and violently churn for from 5 to 20 minutes till emulsion is formed, then add the water.

It also gives the following, which is also said to be an excellent mixture for destroying the red spider.

Quicklime	25 pounds
Sulphur	20 "
Salt	15 "
Water	50 gallons

To Mix.—Take 10 lbs. lime, 20 lbs. sulphur and 10 gallons of water; boil till the sulphur is quite dissolved, then slack the remaining 15 lbs. of lime and the 15 lbs. of salt, and add to the previous mixture, making up the water to 50 gallons. Apply milk-warm after straining. Use in water. Keep stirring while using, and be careful of the hands.

DESTRUCTION OF INSECTS.—The drop or bag-worm, which is very destructive, especially on evergreens, can be kept down easily by hand picking,—and the much dreaded Tussock Moth, which creates so much havoc amongst street trees in cities, can just as easily be mastered by collecting the cocoons in winter and burning them during that season.

THE MIGNONETTE.—This well-known old garden favorite (*Reseda odorata*) is one of the staple products of the florists' greenhouses in winter, and on account of its beautiful fragrance, finds a ready market in the large cities; that is, well-grown mignonette does.

The following is generally the method pursued by the florists: Sow about the first of August, for early cutting, in slight depressions six inches apart each way. Thin out to four plants, and allow no more than two shoots to each plant—if extra strong spikes are wanted, leave only one shoot to each plant—this allows eight shoots to a "hill." All the energy of the plants must be thrown into these shoots, and for this reason all side shoots, or laterals, must be pinched off, leaving only the terminal one. This causes the plants to have long, straight, stout stems with a good terminal truss of flowers. The soil should consist of three parts good loam and one part well-rotted manure, with a good sprinkling of sand. Five inches depth of soil is sufficient in the benches, unless there be too much bottom heat. As the plants grow, fill in the depressions, and firmly fix the plants with the hand. They need full exposure to sunshine.

If the benches are in use in summer time, the seeds can be sown in four-inch pots, and carefully transplanted into the benches, keeping the ball of soil intact, when they are ready to receive them. The variety known as "Machet" is the general favorite with the florists. If properly treated, the plants should be ready for cutting three months after sowing.

WM. FITZWILLIAM.

Orange, N. J.

MAHONIAS AS POT PLANTS.—The *Mahonia* is one of our most popular out-door ornaments. Wherever the winters are not excessively severe, even when the temperature is very low in winter, they thrive well, if not exposed to bright sunlight while frozen,—and if the earth in which they are growing does not get too dry in summer time. But in England they seem to be a favorite element in in-door culture. In a schedule of premiums on the table, we find one offer for twenty Mahonias in variety. One would hardly suppose that there were any great number of varieties in Mahonias, as we see them growing in our gardens; but it is evident that foreign horticulturists are taking them in hand,—and one can readily imagine that a large variety can be selected so as to make a collection of twenty of these plants of great beauty. *Mahonia aquifolia* is the species referred to. The Rocky Mountain form, *M. repens*, is a dwarf and not so showy a one as that.

PEAR GARDEN.—SEE PAGE 135.

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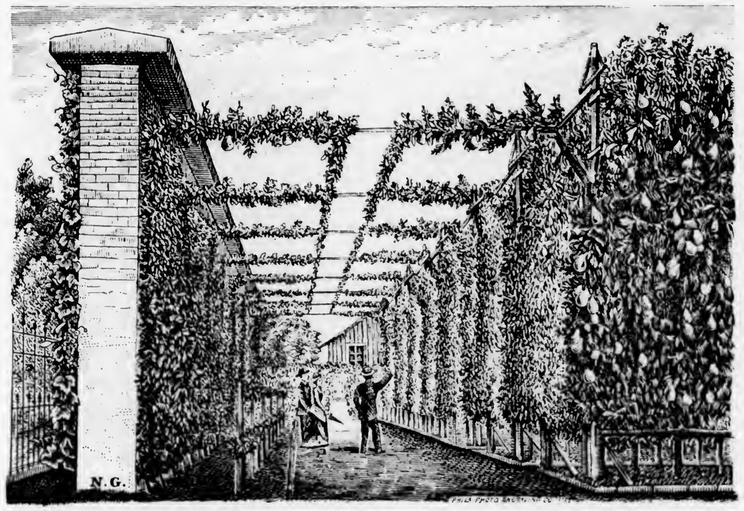


PEAR GARDEN.—SEE PAGE 135.

INTENTIONAL SECOND EXPOSURE

ROSES, AND THE ODOR OF ROSES.—The improvements in rose culture have now made its varieties over 7000, but the works of Redoute, Guillemeau, Buchoz and of many other writers on the "Queen of Flowers," before 1860, show, that until a recent period, the era of large double roses, excepting, perhaps the Provence or Cabbage rose, had not been entered. The old roses were mostly single, a few double and some, semi-double.

Until 1815, the progress of rose cultivation was very slow, then M. Vibert, under the patronage of the Empress Josephine, who made roses fashionable, founded his nursery. The Empress caused search to be made for all known varieties to be cultivated in her garden at Malmaison. Up to 1860 we had very few roses which to-day would be considered of much value, with the exception of General Jacqueminot, among the Hybrid Perpetuals ; and Mme. Bravy, Rubens, Souvenir d'Elise and Devoniensis, among the Teas. From 1860 to 1865, great advances were made and since then still greater.

The names of Paul, Cranston, Cant and Bennett, in England ; Dickson, in Ireland ; Nabonnand, Jacotet, Guillot, Ducher and many others, in France ; are well-known to rosarians, and such roses as Marechal Niel, Gloire de Dijon, Ernest Metz, Paul Neyron, and Hon. Edith Gifford show this advance. Nor is this country behind, as Bridesmaid, American Beauty, Sunset and Mrs. Pierpont Morgan testify. Some varieties have been introduced only recently, for instance, the dwarf Polyanthas, and the climbing, Turner's Crimson Rambler and Alister's Stella Gray ; also Paul's Carmine Pillar and Lord Penzance's Sweet Briars, and the Japanese Rugosas and Multifloras and their Hybrids, which are just coming to the front. In our days of green blooming roses, irises and chrysanthemums, what will be the next rose production is difficult to foretell. We may have black and blue flowered.

Attention has been given by rosarians to vigor, form, color and size, but so far, the difference of perfume in different varieties has been almost neglected, yet distinct perfumes in the different species are recognizable and there are some men who can name varieties in the dark, from the odor. The purest rose odor cannot be defined. It is best represented by two varieties ; one is the *Rosa centifolia*. This grows wild in the eastern parts of the Caucasus and has been largely cultivated in Provence, France. It is commonly known to us in its red variety as the Cabbage or Hundred-leaved Rose, also as the Provence Rose. The other, the *Rosa Damascena*, or Damask Rose, is cultivated in the Orient and in Bulgaria, for the manufacture of Attar of Roses. The red variety of the latter is preferred to the white for this purpose. The Damask Rose is not known to exist uncultivated. Red roses usually have more odor than white. Cut roses placed in water have more fragrance than when attached to the plant, and those flowering under glass, give more perfume than those cultivated in the open air. No two flowers on the same plant have the same odor, and even the same flower will emit, at different hours of the day, a different perfume.

The first attempt made to classify the varieties of perfume in the rose was made at Philadelphia, in 1886, by an anonymous writer.*

In 1889 the subject was further studied in France, by Dr. Blondel.† The following statements are interesting : R. Gloire de Dijon has an odor which cannot be defined. The so-called Tea-roses have not the odor of Tea. The Tea-roses, Melanie Souppert, Marie Guillot, Marie Caroline de Sextoux and Triomphe de Milan have not scent. *R. canina*, *R. sepium*, *R. alpina* and *R. arvensis*, have the odor of Mignonette ; Isabelle Narbonnand, the odor of the Violet as has also *R. Banksia alba*, *R. Banksia lutea* has not an odor. Marechal Niel, Goubalt and Bravy, the first named having a Tea strain, and the latter two being Teas, have the smell of the Raspberry. The odor of the pink may be found in Safrano, *R. Caryophylla*, *R. Ripartii*, Deséglisè and *R. Moschata*. The last, notwithstanding its name, does not have the Musk odor, that is peculiar to the Moss, Salet. Elizabeth Barbenzien smells like a melon, and *R. bracteata* and Macartney, like apricots. Socrates has the odor of Peaches, and Souveraine, a hybrid of a Tea and *R. centifolia*, also smells like a Melon. These fruity odors are frequently blended with those reminding one of the smell of the Banana or Quince.

* See article in the *Gardener's Monthly* and *Horticulturist* xxviii, 1886, p. 249 *et. seq.*

† *Bulletin de la Soc. Bot. de France*, Fevrier, 1889. Also see his : "*Les produits odorants des Rosiers*, Paris, 1889."

Noisette roses do not usually have an odor, but there are exceptions : Unique Jaune has the perfume of Hyacinths, and there is a slight fruity odor to Celestine Forestier, Clavie Carnot, Earl of Eldon and Desprez. Marechal Niel is sometimes termed a Noisette, but it has Tea blood in it, and holds an unique position. The flowers of the varieties of the *R. rubiginosa* mostly do not have any odor but *R. platyacantha*, *R. Capucine* (*R. Eglanteria*), especially, bicolor, smell of bugs (*Cimex lenticularius*) and Coriander ; *R. Beggerina* (*R. coriosma*,) has the same disagreeable smell. *R. villosa*, in some of its varieties, has the odor of Olibanum and Myrrh, and *R. Brunonii* (a moss variety of *R. moschata*) has in its sepals and pedicels, the odor of Pinks. *R. rubignosa* (Sweet Briar) has an odor in its green parts, especially the lower part of the leaves, like the smell of the Apple called Pippin. The glands of *R. micrantha*, *R. graveolens*, *R. glutinosa*, all have a similar perfume. What the composition of the substance in these glands is has not been studied. The leaves of *R. lutea* or *R. Capucine*, smell something like Jasmin. The petals of *R. Gallica* have only a slight odor when first gathered, drying developes the perfume, but the odor of *R. Damascena* is almost destroyed by drying.

In Persia, *R. moschata* is used for making Attar ; in Bulgaria, *R. Damascena* ; in France, *R. centifolia* ; in Germany, the Bulgarian variety of *R. Damascena*. There is no reason why the making of Attar should not be an industry of the United States.

In Bulgaria the Attar is always adulterated, usually with "Indian Geranium Oil," (*Andropogon Schœnanthus*,) or one made from varieties of the *Pelargonium*. Hindu Attar is also adulterated with oil of Sandal-wood. The Germans and French are now distilling a fine Attar. The French has a green color, the Turkish is yellow. The latter is adulterated with "geranium oil." Distillation, however, destroys the true rose odor for it is so delicate that it will not stand heat. By the French system of making rose pommade through maceration in warm fat, a compound usually of hog's lard and beef suet, or in olive oil ; the odor can be obtained pure and the fat, impregnated with the odor, is then shaken by machinery, in closed vessels, with 90 per cent. alcohol at a very low temperature, and results in the oil of rose becoming absorbed by the alcohol and completely separated from the grease, preserving its pure rose perfume. Many attempts have been made to improve on this method, but they have not been successful.

There are many parts of our country in which the rose plant grows in the open air to great perfection, for instance, South Carolina and Texas, and the manufacture of rose oil and rose water could be conducted at much profit.

ISAAC MYER.

HACKBERRY. — Noting the observation of Thos. H. Douglas, of Waukegan, Ill., the Kentucky Coffee tree and Hackberry are both found quite plentifully in the natural groves of the prairies and also in the natural timber covering the river bluffs along the Missouri, having noticed the Hackberry as far north as Sioux City,—but I think it can be found beyond that point. The Coffee tree is planted some as a street tree in Omaha and Council Bluffs, but the pods being so attractive to boys, who climb and break them citizens give that as an objection to having them on the premises or streets. The Hackberry is highly prized, chiefly because it is an improved or glorified elm. Its straight habit places the top higher in the air and the high western winds have less hold on the tree. But its fine corrugated bark is a chief attraction and this in itself makes it a finished and a fine object on a lawn. The Hackberry should have more attention.

W. M. BOMBERGER.

Hurlan, Ia.

It would be agreeable to have the dimensions of the largest Hackberry known. The largest ever noted by the conductors, were in the vicinity of Cincinnati. It is now long ago,—but in memory they appear twelve or fifteen feet in circumference. *Celtis occidentalis* is referred to.

TREE LABELS.—The Kentucky Institution for the education of the blind, at Louisville, has invented a tree label by which the letters are raised by being stamped on soft metal. While having them made for themselves, they would make others cheaply for public parks or other places where named collections of trees are desirable. Education for the blind has progressed wonderfully.

NEW OR RARE PLANTS.

IMPROVEMENT OF THE COSMOS.—Under date of April 16th, Mrs. Theodosia B. Shepherd says: I am doing a great deal with *Cosmos*; it is a flower with wonderful possibilities, and one that is very delightful to work with. I expect, within a short time, to bring into existence some flowers, that the general public do not dream of;—exquisite double *Cosmos*, dainty flowers, resembling tassels, double Amenone flowered, and many others of charming form. Cosmos is as full of freaks as the Chrysanthemum, and is destined to be as valuable, if not more so to florists, than the Queen of Autumn. I am in love with the flower, I have at this time, a field of it in full bloom, something that has never happened before, at this season, it is volunteer crop with plants two feet high, having magnificent flowers, very large, of perfect form and beautiful colors. Think of Cosmos in full bloom outside in March and April, the beautiful fancy varieties which you see in the pictures I send you, and many others besides.

The seeds were dropped from the tall plants, which bloomed last season, and I am hoping for an early blooming strain of more dwarf habit from the seeds of this early crop."

As the *Cosmos* is closely related to *Dahlia* botanically, one may reasonably look for as much variation in one genus as the other. There is little doubt but that Mrs. Shepherd's pleasant visions of the Cosmos of the future will be abundantly realized.

SPIRÆA VANHOUTTEI—Those who have seen clear white snow hanging in festoons and various forms of drapery over rocks and banks in drifting weather will recognize the resemblance in a flowering bush of *Spiræa Vanhouttei*. It is one of the most charming ornaments in a spring scene in the shrubbery border. It is said to be a hybrid raised by Mr. Zabel of Munich,—but it is hardly more than a sport from the well-known *Spiræa Reevesii*, on which it is a decided improvement. *Spiræa Reevesii* itself is indeed only a varietal form of an old Asiatic species known as *Spiræa Cantoniensis*.

FLOWERS OF CYCAS REVOLUTA.—In the November number, 1895, of MEEHANS' MONTHLY, it was noted that the Common Sago Palm of our gardens, had flowers of separate sexes on separate plants. An illustration of the female form was then given. To make the history complete an illustration of the male form is given, for which we are indebted to the courtesy of the *London Journal of Horticulture*.

CYCAS REVOLUTA.

CLADASTRIS TINCTORIA.—The beautiful but rare tree, *Cladastris tinctoria* or, as it is still called in some catalogues, *Virgilia lutea*, seems to have attracted a more than usual amount of attention this year, judging by notes in correspondence in reference to it. The long cymes of white pea-shaped blossoms, are produced in unusual abundance. It is probably becoming more planted.

THE HARDY FLOWER GARDEN.

PÆONIES.—Some plants are like the much traveled Scotchman of whom it was said that he felt himself the most at home when he was abroad. These plants like to be moved from place to place in order to get the best results from them. But there are others that like to be let alone. The Pæony is one of these. Nothing can exceed the grandeur of a Pæony root that has been left in one spot for a number of years. But it loves a good top dressing of manure every year. Some raise small hoops around the stems when growing, which keep the weight of flower heads from falling apart in a storm.

SICK GLADIOLUSES.—Gladioluses as well as many summer flowering bulbs, suffer easily from root fungus, which starts primarily from half decayed manure. All fertilizers for these plants should be free from fungus-supporting material. Where bulbs are grown on a large scale the ground is usually manured a year previous, so that all vegetable material may be thoroughly decayed.

GLADIOLUS COMMUNIS.—A remarkably beautiful herbaceous plant, though rare in our gardens, is the wild corn-field *Gladiolus* of Greece, and Asia Minor generally. It is perfectly hardy in American gardens, and brightens June by its purple flowers. These are not as showy as the improved forms, but are still very attractive.

FRUITS AND VEGETABLES.

ASPARAGUS CULTURE.—Amateur gardening has been annoyed by the Asparagus beetle. It can readily be destroyed by Paris Green, but no one likes to use this poison, while the crop is being cut. If one can make up his mind to give up cutting early, and then use the poison, the whole crop of insects can be destroyed in one season. Great care must however, be used to keep the Paris Green from blowing on other vegetables. It is a dangerous poison in a vegetable garden, though quite safe in prudent hands.

SPECIAL FRUIT CULTURE.—Good fruit seems to fall into our laps so readily, that we can hardly realize the trouble taken with them in other parts of the world. In most parts of France, Belgium and Germany they can set out pear trees, and in time gather pears just as we do,—but they can get something better by a little care and cost, and in this way pleasure and profit go together. By profit the mere cash idea is not intended,—but that profit which we all feel in beating nature at the same task. We give an illustration on page 131 of a Pear Garden, taken from Nicholas Gauchers beautiful "Handbuchder Obstcultur" published by Paul Parey, of Berlin.

The owner has been to heavy expense in constructing walls and trellises on which to train his pears,—and given much time and thought to the careful training. He feels richly repaid in the large and luscious fruit which no mere orchard grown fruits could ever compare with. One good result of this work is that the one who undertakes it soon becomes a master in the general art of pruning. It is a good school.

EARLY CORN.—In no class of vegetables is there a greater difference in the time of maturity as in sweet corn. Some varieties will yield corn fit for table use in six weeks. Many years ago there was a variety introduced called the Squaw, which forestalled all competitors in this respect. Many attempts have been made to outdo this variety in the respect of early maturity, but it is understood that no earlier variety has yet been produced.

TWIN EARS OF CORN.—Twin ears of corn—Siamese fashion—are not uncommon, but the only instance of two wholly distinct ears in one husk that has came to the knowledge of the conductor is furnished by Mr. Timothy Wheeler, Moscow, Vermont. One is eight-rowed and the other twelve. They are fine specimens.

THE MUSCAT OF ALEXANDRIA GRAPE.—Will you please give us your opinion on the following question in regard to setting of Muscat of Alexandria grapes.

A. says, "I leave all the flowers on the vines until the fruit is set so as to have plenty of pollen in the house,"—and further says "that the perfecting of flowers requires no extra effort on the part of the plant."

B. on the other hand says, "it does require an effort on the part of the plant to bring forth flowers and perfect pollen," and that "his practice is to cut away all superabundant clusters before the flowers open."

ALEX. MACLELLAN.
Sec'y. Newport Horticultural Society.

Both parties are right. It will be difficult to decide on which side the balance of the argument favors.

It has been proved that the saving of energy, by cutting or pinching off the tendrils as they appear, is an advantage. This must be as true of the prospective bunches, which are merely more fully developed tendrils.

On the other hand many of the flowers of the Muscat of Alexandria have pistillate flowers; or, what is practically the same thing, flowers with defective anthers. In this case an abundance of pollen is desirable.

It may be considered that the latter condition is not constant. In some cases the vines have few imperfect flowers. In other cases they are abundant. What is the better practice will depend on the conditions in each case, which the experienced vine grower will have to decide for himself as the circumstances occur.

APPLE, RAWLE'S JANET OR RALLS' GENET.—In your May issue you state: "It has always been understood that one of the apples indicated was raised by Mr. Caleb Rawle, in Amherst Co., Virginia, and that he named it for his daughter, Janet." In the report of Dr. Howsley on Nomenclature of Apples, *vide* Proceedings of American Pomological Society for 1871, pp. 74 and 75, we find the following: "Rawles' Genet is the proper spelling of the name of this apple, and not Janet, as it is usually spelled." It would require too much of your valuable space to report his reasons at length. Briefly stated, Thos. Jefferson became acquainted with this apple during the administration of General Washington. M. Genet was sent to this country as Minister of the French Government.

M. Genet had apples of the variety in question sent him from France for his own use. Mr. Jefferson so admired this apple that he procured scions and gave them to a Mr. Rawles (Ralls), a nurseryman and fruit grower, of Virginia, for propagation.

The last named gentleman propagated trees from these scions and introduced them as Genet.

Mr. Darney introduced this variety into Kentucky, about 1795, as Genet.

It was not called Rawles' Janet prior to 1810.

Dr. Howsley states that within his recollection, this apple was in the neighborhood of Lexington, Ky., called Jefferson Pippin, thus showing the connection of Mr. Jefferson with its introduction.

A letter from Chas. L. Ellis, Clerk of Amherst County Court, Va., of date, February 14, 1892, in reply to an inquiry as to the spelling of Caleb Rawles' name, stated that it was spelled R-a l-l-s. In reply to a letter of inquiry sent from the division of Pomology May 4, 1896, Mr. Wm. Sandidge, the present Clerk of Amherst County Court, Va., states: "I find the name "Rawles" of record in this office in several instances, but no "Caleb Rawles." The name of "Caleb Ralls" appears several times. We believe these are "good and sufficient" reasons for the name Ralls Genet, as used by the division of Pomology.

S. B. HEIGES,
Pomologist, U. S. Dept. Agriculture.
Washington, D. C.

CARE OF GARDEN TOOLS.—The vast difference between a clean shining garden tool and one covered with rust can scarcely be appreciated by one not accustomed to their use,—and even those who have to use them do not often think spades, hoes, forks, etc., should always be kept bright. Where there is much hoeing to do the laborer should have a file with him. A bright sharp hoe is worth half a laborer's time.

STRING BEANS IN THE FALL.—There are few more delicious vegetables than String Beans, when they have no sign of strings. Sown in August, in very deep and rich soil this luxury will be realized through October.

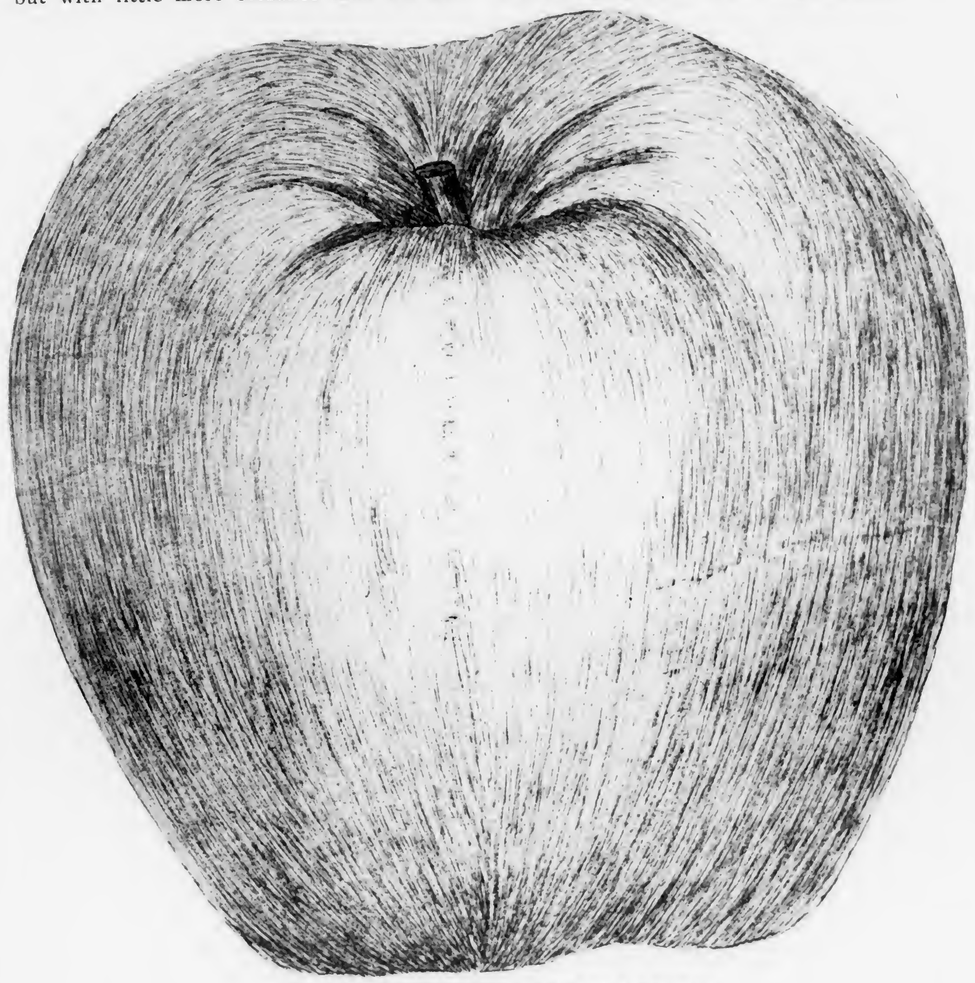
THE LARGEST APPLE KNOWN.—Considerable interest has been manifested in the question of the largest apple known since the illustration given of the one in our last volume. The following note from Prof. S. B. Heiges, Pomologist in the United States Department of Agriculture at Washington, brings to light a still larger one. This is probably the one referred to in western serials as having been grown in the State of Washington:

It is remarkable that no one knows who originated, discovered, or named this variety Maryland and New York have both claimed, but with little more evidence than the bare claim itself. Its chief merit is in its size, as it does not bear abundantly, nor is its flavor or general quality very high. One merit is that it keeps pretty well during most of the winter season.

"In a former issue of your valuable Monthly there was a description of a very large apple together with an illustration of its outlines.

There is in our collection of apples in the division of Pomology the model of a Gloria Mundi which surpasses in both axial and transverse diameters the one outlined.

The accompanying painting will enable you to form a proper idea of its immense size.'



GLORIA MUNDI--LARGEST APPLE KNOWN.

BIOGRAPHY AND LITERATURE.

WELL DONE.

It may not be our lot to wield
The sickle in the ripened field;
Nor ours to hear, on summer eves,
The reapers' song among the sheaves.
Yet where our duty's task is wrought
In unison with God's great thought,
The near and future blend in one,
And whatsoe'er is willed, is done.

—WHITTIER.

GRAPE FRUIT OR SHADDOCK.—The Shaddock or grape fruit as it is commonly called in our markets, is getting more than usual attention, on account of the increased taste for it among our people. It is said to be a cultivated taste, as those who enjoy it cared little for it on the first venture,—but after a while it affords so much pleasure, that many prefer it to the best flavored orange that could be offered them. The early history of the fruit is lost in obscurity, the only point on which all agree is that it must have been wild originally in some local spot somewhere in Asia. There are some who contend that this local Asiatic spot must have been the Garden of Eden, and that this is the exact beautiful fruit which the unfortunate or fortunate progenitors of our race were forbidden to touch. On account of this supposition, it often bears the name of the forbidden fruit. The further argument brought forward to sustain this view is that as no one seems to like the fruit particularly on the first bite, its subsequent popularity is merely because it is a forbidden fruit,—there being a sort of perversity, ever since the unfortunate day on which our first parents erred, inborn in human nature to hanker after all things supposed to be forbidden. Besides there are some cynical old bachelors who ought to be ashamed of themselves, who declare that even in these days it is more the women than the men who have acquired the forbidden grape-fruit taste, just as it is related of good lady Eve. There are some who consider the shaddock and the forbidden fruits as essentially different, and some botanists have classed the shaddock as *Citrus decumaria*, and the Forbidden Fruit as *Citrus Paradisi*. But with the common people the names seem inter-changeable. The name grape-fruit is from the habit of the variety growing the fruit in clusters instead of singly as in the common orange,—a method both the shaddock and Forbidden Fruit have in common if indeed there is any difference of note, worth noting between them.

There are few more beautiful sights in this degenerate world than a large grape fruit tree with the fruit just a ripening,—and it must be conceded that if it really was the tree that tempted Mrs. Adam to disobedience, it was a temptation none of her descendants could have better resisted than she.

TREES STRUCK BY LIGHTNING.—It is stated that investigations made by Dr. Carl Müller, and reported in *Himmel und Erde*, show that lightning prefers to strike certain kinds of trees. Under the direction of the Lippe-Detmold Department of Forestry, statistics were gathered, showing that in eleven years lightning struck fifty-six oaks, three or four pines, twenty firs, but not a single beech tree, although seven-tenths of the trees were beech. It would seem, then, that one is safer in a storm under a beech tree than under any other kind.

So far as the observations of the conductors of MEEHANS' MONTHLY go, no species of tree is exempt from lightning strokes, and it would not therefore be safe to fly to any one for protection in a storm. There seems to be a tendency in electrical storms to favor certain local areas, and the trees, whatever they may be, suffer more than those outside this local limit. One such case comes to mind while writing this paragraph. Trees on a slight elevation from surrounding ground, have been repeatedly stricken during the last half a century, while others but a few hundred feet beyond this spot, have had immunity. It seems the tallest trees, instead of any particular species, that attract the current. But even this may be wrong

WATER IN PLANTS.—Professor Asa Gray is reported to have once said that the Washington elm at Cambridge has been estimated to produce 7,000,000 leaves, which would make a surface radiation of about five acres in extent, and give out every fair day in the growing season seven and three-fourths tons of moisture.

It is barely credible that all this water was stored in the earth within the area covered by the roots. Is it a fair question how the tree obtains so much moisture for evaporation daily. Much more mysterious seems the case of a Japan Ivy, *Ampelopsis cuspidata* (*Veitchii* of gardens.) Plants covering the walls of some lofty buildings must have as many leaves as the Washington Elm at Cambridge. Yet the moisture which daily has to go—under prevailing hypotheses—to the amount of seven or eight tons daily through the leaves, all has to pass through a stem no thicker at the ground than one's finger. It seems a physical impossibility. Is it probable that living plants have the power of converting gases into liquid,—and that it does not all come into the system as water, through the roots?

THE VALUE OF COLLECTIONS. — Professor Agassiz once said that the ability to make comparisons was about all of the faculties necessary to start one on a successful study of natural history. Mr. Newlin Williams well says of those who make herbariums or collections of dried plants.

"There is a tendency in the human mind to bring together related objects for the purpose of comparison. It is a trait the mental mechanism almost invariably possesses,—a trick of which it is blindly fond. For who has not made a collection? You and I are in evidence. What has not been collected? Everything is on record, costumes, coins, herbaria, bones, books, paintings, gems, beans, bottles, teapots, tulips, arrow-heads,—even dollars, which vary less among themselves than many of the foregoing, yet would often afford interesting stories of acquisition."

NATIONAL DISTRIBUTION OF FLOWER AND VEGETABLE SEEDS.—During the month of May, the government distributed garden seeds at the rate of about 10 tons per day. The seeds distributed cost about $53,000,—while the labor of putting them in small packages and distribution cost $80,000. Congressmen may now look forward anxiously for next season when they may get a good fat appropriation for the national distribution of mouse-traps, tooth brushes, ribbons and fine tooth combs. These it is believed will render the congressman even still more "solid" with the voters than flower and vegetable seeds, which require some labor to plant. Half of the seeds sent out are never sown, as there is not enough in a package to make it worth while,—but they come like Easter cards, as pleasant reminders of the congressman's obligations. Combs and mouse traps, it is believed, will be a more lasting reminder.

SWEET-SCENTED HONEYSUCKLES.—Some of the early American works on botany described under the term of *Lonicera grata*, a species of honeysuckle closely allied to the English, and equal to it in sweetness. No one has ever been able to find it,—should any one know of such wild species they would do good service by making it known. The famous English *Lonicera Caprifolium*, the delight of English poets and a deserved favorite with English cottagers, does not seem to have made itself at home in American gardens. It has frequently been introduced, but we never met with it.

DR. RAVENAL'S HERBARIUM.—The Herbarium of the celebrated Southern Botanist, Dr. Ravenal, is preserved in the Female College at Spartanburg, South Carolina. The Professor of Botany in the college is a lady, and is reported as doing excellent work in training young women to a love for the amiable science.

DR. WILLIAM SAUNDERS.—Queen's University of the Dominion of Canada has conferred the degree of Doctor of Laws, on Prof. Wm. Saunders, whose eminent services to agriculture, horticulture, and the sciences bearing thereon, it is intended in this pleasant manner to recognize.

WAFER ASH.—A correspondent notes that Wafer Ash must have been originally a misprint for Water Ash. Its most common name is, however, Black Ash,—botanically, *Fraxinus sambucifolia*. It loves to grow along water courses.

GENERAL NOTES.

MYSTERIES IN SCIENCE.—What we do know is so little in comparison with that which baffles us, that the pride of man is humbled when he contemplates the fact. Here before us is a White Pine tree in which the leading shoot that forms the trunk, ultimately goes so straight upwardly, that a plumb-line can show no deviation from the perpendicular, while the lateral branches push out at a right angle with the stem. The power which directs these different directions is wholly unknown,—and then note how this direction varies in different trees. While the leader in a Norway Spruce is directed as truly perpendicular as the White Pine, the lateral branches are at an acute angle,—and the angle of nearly the same degree in all the individual of the species. If we then compare the angular divergence with other species, we find that most have a plan of their own, which is followed through all the individuals of the species,—nearly all, for "never" is a word unknown to Nature. Of the atmosphere around us, we know scarcely anything. In other eyes than ours it would look like a huge aquarium in which myriads of forms of plants and animals are floating, while man would look like a little streak of black sand, strewn along the bottom. Even the elements of which this atmospheric sea is composed, are in a measure unknown, judging by discoveries continually made. We had thought we knew, and that oxygen, hydrogen, nitrogen and carbonic acid gases alone constructed it,—but now we have found another, which has been named Argon. Once we had concluded that hydrogen was the mother of all the other gases. It looks as if Argon was, in the new light,—but then even Argon may have to go.

FROG CULTURE.—In England a term in derision often applied is a "frog eating Frenchman" which the Frenchman retaliates by his "beef-eating Englishman. But Americans are competing with France in the frog-market, there being quite a demand in some cities for froggy-legs. Some farmers find frog ponds profitable. But even this seemingly easy thing requires brains to make it profitable. Unless the tad-poles are protected, various varmints prey severely on them.

BEES AND HONEY.—A newspaper dispatch from Honesdale, Pennsylvania, under date of May 12th, says:

"The apiaries of Wayne County are almost entirely destroyed, the bees having been killed by the long-continued drouth of last season. It seems that the bees were poisoned by the gathering of some herb. In the Wayne County townships, skirting along the upper Delaware river, not a single hive has escaped."

Surely loose statements like these are not creditable to the modern spirit of close investigation. It is not probable, as this magazine has always contended, that nectar from any flower is ever poison. That some microscopic element may work on honey and render it poisonous at times is probable,—but this could readily be ascertained.

MINERALIZED WOOD.—Trees which have been converted into flint are often found in the earth. This is known as Silicified Wood. Silica in solution is absorbed by the timber. It is not often that trees are found turned to iron in a similar manner; but a good specimen of this character was recently unearthed at the Village of Three Tons, in Montgomery County, Pennsylvania. It affords the newspaper paragraphers texts for mysterious "iron trees" in past ages.

A GREAT EXHIBITION IN HAMBURG.—American lovers of gardening, visiting the Old World, are invited to take in the great exhibition at Hamburg, which opened May 1st, and will continue till September. Every few days there will be a different set of exhibits. Schedules may be obtained from Dr. T. G. Monckeberg, Secretary, Hamburg. The Chrysanthemum section is expected to excel.

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VOL. IX. NO. 410

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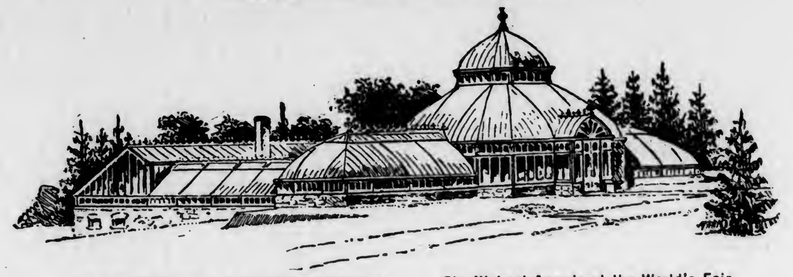

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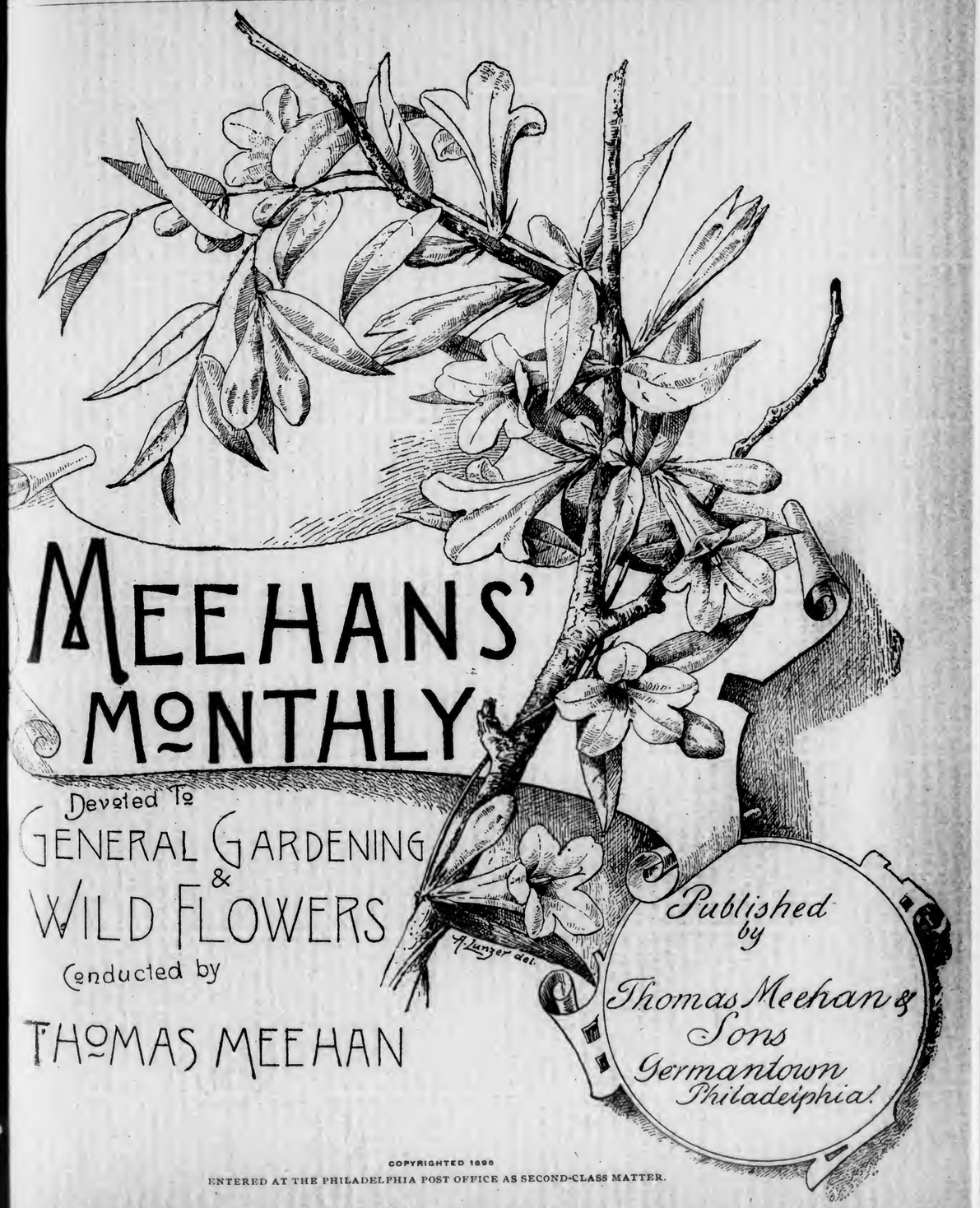

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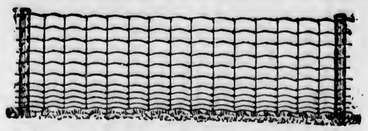

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HYPERICUM KALMIANUM.

KALM'S ST. JOHN'S WORT.

NATURAL ORDER, HYPERICACEÆ.

HYPERICUM KALMIANUM, Linnæus.—Branches four-angled, branchlets two-edged; leaves crowded, glaucous, oblanceolate, one to two inches long; flowers few, in a cluster, one inch wide; pods ovate, five-celled. (Gray's *Manual of the Botany of the Northern United States*, and Wood's *Class-Book of Botany*.)

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Possibly the locality where Kalm's St. John's Wort may be seen in the greatest luxuriance and beauty is along the western shores of Lake Michigan, where it is one of the shrubs that aid in forming the singular sand dunes of that region,—little hillocks, which, only for the vegetation covering them, might be taken by one at a distance for flocks of sheep. The sand, in the winter season, drifts between the branches of any shrubby plant, covering it all but its tops—in the *Hypericum*, say up to Fig. 1 in our plate. When spring comes and growth follows, the whole surface of the sand is covered by what appears to be a clothing of vegetation of but a few inches high; that is the portion above the figure indicated, which in turn is filled in with sand the ensuing winter. In this way the sand-hill increases in size from year to year. The brilliant golden blossoms, which in June cover these dunes when

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made the home of this plant, is a sight once seen that is never forgotten. To one sentimentally inclined, they might readily suggest the children's heads on the Eve of St. John, crowned by flowers of another species, which historians tell us are very commonly seen in some countries; the flowers being placed there as a sacred rite, protecting the children from the machinations of evil spirits, a practice from which it is said, among other reasons, the popular name of St. John's Wort is derived.

In relation to the term Wort, as applied frequently to this and other old and well-known plants, it may be noted here, that it is an old Anglo-Saxon word used to distinguish low-growing or herbaceous plants from trees. In the latter case it was customary to use the word as part of the regular designation. Thus we had the apple tree, the pear tree, the plum tree. So among the humbler classes of plants we have colewort, the cabbage plant, the milk plant, the Saint John's plant, and so forth. In its original it was written wyrt.

To the structural botanist the plant has an interest by the increase in the number of carpels or divisions of the fruit over the number in its allies. While *H. prolificum* has but three styles, and consequently but three carpels, *H. Kalmianum* has five. But even this character is not definite, as our artist has noticed it to occasionally have six, one of which is shown in a cross-section in Fig. 3 and 4.

Another interesting feature which our species possesses in common with all of the genus is the apparent perforation of the leaves. When held up to the light, subtransparencies appear, as if the leaves were pierced with holes. One species is so profusely dotted in this manner that it has been specifically denoted as *Hypericum perforatum*. But these vary in size and character, and one might, with some experience, identify a species by the character of these perforations. In the present species, *Hypericum Kalmianum*, they are small and comparatively obscure, resulting apparently from the thick texture of the leaf, which is rather more leathery than in most of its allies. These perforations are really oil glands. In many cases the oil is very fragrant, and the dried leaves retain a pleasant odor for many years. A European species, *Hypericum Androsæmum*, and which is commonly known by English country people as Tutsan, is gathered for preparing dried leaves which are placed in drawers with clothing, used as book-markers, and also for other pleasant purposes. The nature of these glands has been in doubt,—but our plant, and its allies, have aided much in furnishing us a knowledge of their character. In this and other species they appear as mere circular perforations,—but in some they have an elongated form, while others have been noted to assume the character of transparent veins. In some cases dots, as such, disappear, and their place is occupied by a reticulation of transparent lines, which emit the same odor when bruised, as do the regular perforations. There is little doubt from these observations and comparisons, that the oil dots in these plants, and probably in many other plants, are merely the terminals of small veinlets which have been transformed to cysts for the purpose of collecting together little doses of fragrant oil.

This plant, in common with some other species of *Hypericum*, shows the influence which the varying intensity of growth rhythms has on the characters which go to make up what we know as species. Growth is not one continuous and regular movement, but proceeds in jerks or rhythms. In the lower portion of the main stem (in the plate), the leaves are small, and the space between each course of leaves narrow. As the growth-wave increases in intensity, the inter-spaces widen, and the leaves increase in size. As the wave loses its force, the leaves and spaces again shorten. In some plants the growth-wave ceases somewhat gradually, then we have a spicate or paniculate inflorescence. In the case of this *Hypericum*, the wave has ceased so suddenly to flow that two of the axillary buds at the base of the flower have felt the rebounding force, and have developed into growths which have resulted in a cymose form of inflorescence. It is thus seen how much the varying intensity of the rhythmic waves in growth has to do with varying forms, and this discovery is having much to do with theories accounting for the origin of species, which subject has become one of the most fascinating biological studies of the present age.

EXPLANATION OF THE PLATE.—1. Lower portion or last year's wood of a branch from a Lake Michigan specimen. 2. Young carpels of a primary and suddenly arrested flower, with two axillary branchlets at the base. 3. The same magnified, but with 6 carpels. 4. Cross-section of the same. Cross-section of the normal ovarium.

WILD FLOWERS AND NATURE.

A WOODLAND SOLITUDE.

"And in the woods of Aldornere he found
A solitude befitting his sad mood.
Far in those depths there is a woodland stream
That wells from springs within the silent hills.
Here, o'er its ledge, a tiny waterfall,
Pouring into its basin in the rock,
There sleeping quietly, a fairy mere,
On snowy pebbles set in golden sand."

—HOWARD WORCESTER GILBERT.

SUGAR MAKING. — Dr. W. H. Seaman, Washington, D. C., observes:

"I regret much to see grave scientific errors in a journal holding the position of MEEHANS' MONTHLY, but such is the statement on page 113, by the Editors that the 'chemist cannot make sugar.' On the shelf of our office stands a sample of sugar syrup sworn to as made by a certain chemical process; but even if it was not already made, there is no possible compound that may not be made by the chemist. Only *structure* baffles him."

So much, not generally known, was indicated by Dr. Seaman's card, that further information was invited, to which Dr. Seaman courteously responds as follows:

"To the chemist, sugar is the name of a class of bodies, distinguished by having six atoms of carbon or a multiple thereof combined with hydrogen and oxygen in the proportions to form water. There are many kinds, some of which were made years ago from acetylene gas, while all our glucose or table syrup is made from starch by a chemical process at the present time. Until recently, we did not know how to make cane sugar by synthesis, but that was lately discovered, and the syrup of which I spoke was a solution of cane sugar. It does not follow that a chemical process perfectly successful in making a substance, necessarily goes into practice; that depends entirely on relative cost. Alizarin from gas tar has compelled the abandonment of the cultivation of madder;—Bayer, after ten years of unintermitted labor, found out how to make indigo, but not so cheap as the Hindoos can grow it; but other dyes will make the indigo color, and its cultivation will be abandoned because of cheaper substitutes. This will ultimately be the fate of the sugar cane. If we could make the starch grain, we could dispense with the former entirely, as an unnecessary luxury."

NAMING OF VARIETIES IN PLANTS.—I should like to inquire if there is an adequate reason for not specially naming the white variety of *Cichorium Intybus*? Prof. Gray, in his "Manual of Botany," tells us that "vain is the attempt to draw an absolute line between varieties and species." Now, without questioning this statement, which I believe is correct, it would seem that where there is a known variation of distinction and permanence, it should be recognized. It has long been a mystery to me how the white flowered chicory, and the white variety of *Verbascum Blattaria*, escaped being catalogued at a time when it was the custom to so dignify every noticeable variation in plants, and especially as our accepted text-books preserve many varieties, whose only distinguishing qualification is the difference in the color of the flower, the difference giving the name to and stamping the variety. While I recognize and admit the force of the arguments against the multiplicity of species, still I think the line may be too rigidly drawn, and it would certainly seem that permanent variation like those named are well worthy, and should be given, a distinct place in our botanical nomenclature.

Philadelphia, Pa. EDWIN C. JELLETT.

PRAIRIE ROSES.—Some few years ago, Mr. John Feast, a nurseryman of Baltimore, undertook the improvement of our Wild Rose, *Rosa setigera*—of a number of these, two, the King of the Prairies and Baltimore Belle achieved a wide celebrity. With the passing away of Mr. Feast further advance rested. There is a fine field for some one here. If an everblooming race of prairie roses could be effected it would make any one's fortune.

THE GROWTH OF WOOD IN TREES.—I was much interested in the article commencing on page 45, entitled "Annual Wood Circles in Trees." Your observations, relating to the *time* or *days* of the tree's growth, were quite interesting, as I had never seen any observations in this line before; and, in connection with this, I thought it might be interesting to you, and perhaps to your readers, to know in *what part* of the day the tree made its growth, providing you are not in possession of the facts already. I have a clipping from a paper reading thus,—"The Growth of Trees."

"The government entomologist of Tasmania reports on the results of experiments relating to the growth of trees at different times of the day.

Measurements were taken as far as possible every three hours, with the following results: from 6 A. M. to 9 A. M. 8⅔ per cent. of growth, from 9 A. M. to noon, 1⅓ per cent. of growth, from noon to 3 P. M., no growth, from 3 P. M., to 6 P. M., no growth, from 6 P. M., to 9 P. M., 1¾ per cent. of growth, from 9 P. M., to 12 P. M., 3⅞ per cent. of growth, from 12 P. M., to 6 A. M., 85 per cent. of growth."

Please allow me to state some conclusions I have come to by study, reason, experiments and observations.

I know nothing about elaborated sap. Sap or water *does not* pass *down* in summer. Wood cells can be developed, (under suitable conditions) into roots or branches. I regard the leaves of trees similar to expanded bark, as one botanist has said, and so, I regard their offices similar. As yet, I am unable to see how the food of a tree passes *down*, I am compelled to seriously doubt it. The elements that go to make up a tree are of two classes and drawn from two sources,—soil and atmosphere. These elements are mineral and gaseous. Most of the mineral elements were stored up in the tree the year previous to their assimilations, but the gaseous elements are taken from the atmosphere when needed for assimilation.

Moscow, Vt. TIMOTHY WHEELER.

This specially valuable contribution by Mr. Wheeler deserves the close attention of all who love to explore the treasure box of nature's mysteries in relation to plant life. The experiments of the Senior Conductor of this magazine show that the increase in the girth of trees only takes place during a few weeks about midsummer,—and now it appears that this daily increase, in Tasmania at least, occurs mainly between midnight and morning. Many of the conclusions of Mr. Wheeler, though not yet generally taught as sound theories in Horticultural Science, are fast being generally adopted,—the only one that is yet debated is the manner in which the food which the leaves prepare is carried to the cells which are to be the parents of the new wood layer. The whole woody structure of a tree is carbon, or, as one might say in popular language, charcoal. It seems incontestible that this carbon can only be taken in from the atmosphere through the medium of the leaves. Certainly, if the leaves of the tree be removed for a season, the tree dies. Explanations which seem clear to their authors are given, but the writer confesses that no explanation as to how this carbon gets to the new cells has ever been made quite clear to him.

POPLAR LEAF-STALKS.—Says Mr. F. N. Tillinghast:—"What purpose is served by the lateral flattening of the petioles in *Populus tremuloides* and some other poplars?"

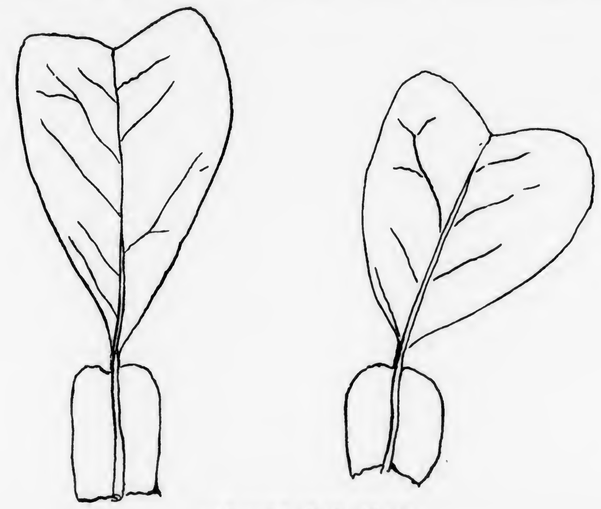
One might reasonably ask, what purpose does the petiole itself serve? There are thousands of species of plants with absolutely sessile leaves,—no leaf-stalk of any kind.

The writer of this delivered an address before the American Association for the Advancement of Science, many years ago, at Montreal, entitled "Variations in Nature" in which he took the ground that variation, for the mere sake of variety, was essential to the existing order of things,—and therefore it was futile to look for special purposes in every peculiar form or condition. That paper was honored by the attention of many eminent men, and the author was complimented by Professor Asa Gray on the conclusion of the address by the remark that he cordially endorsed the views propounded, adding, however, that "they were not Darwin's, as he had spent all one evening trying to convince him to the contrary." The views certainly conflict with the Darwinian enunciation, that every organ is arranged with a view to fitness for a struggle for life; and it is doubtless this thought which has suggested the query. The answer would be, from the author's point of view, "no special purpose at all."

ADNATE STIPULES IN LEAVES OF LIRIODENDRON.—The discussion between Mr. Theo. Holm and Mr. Arthur Hollick in a recent number of the *Botanical Gazette*, regarding adnate stipules in the leaves of the *Liriodendron*, was especially interesting to me.

It seems rather strange that Mr. Holm, who has made such a careful and thorough study of the *Liriodendron* leaves, should assert so emphatically that "the stipules are free in all the leaves of our Tulip Tree, not only on the saplings, but on all the branches from seedlings to mature trees."

And again that he should say "any one who has studied vernation in its various forms will appreciate the fact that the *Liriodendron* leaf could not possibly assume the position it does in the bud if the stipules were not free."



LIRIODENDRON LEAVES.

I have found a number of specimens in which *the stipules are adnate*,—generally only small, immature leaves have been found with such stipules, as shown at Figs. 1 and 2. Finding them thus, however, strengthens the grounds for plausible speculation concerning the probability of an early or ancestral form in which the stipules were adnate.

Several specimens were found during the past season in which the large, conspicuous stipules were adnate, the leaves being normal as to maturity, size and length of petiole.

MRS. W. A. KELLERMAN.

The senior conductor of this magazine had to thank Professor Asa Gray for teaching him that the expression "in all cases," "never," and such like, were very dangerous forms of speech for a student of plant-life to use. Mr. Holm will probably be equally as thankful to Mrs. Kellerman for putting him on the guard against them, though seeming so natural after extended experience in a given line.

We would commend to all our readers the study of these Tulip Tree stipules. They teach strongly that a leading duty in the life of a stipule is the protection of younger parts of the plant. He may even conclude that bud-scales in general (being careful not to say "always") are only modifications of stipules. Carefully opening the apex of a growing branch, he will see by the manner in which the young leaf is bent over, why the leaf when mature has such a truncate or clipped off appearance at its apex. If he will now find a Tulip Tree just sprouting from the seed, he will find the first two leaves not truncate, but purely ovate like a magnolia. He will see that the reason of this is that there is not yet any axis for the young leaf to be caught into, and so it cannot be truncate. With a little observation of this character he may learn that there is no need to looking back for ancestral traits, or speculating on reversions, to account for varying forms.

THE AGENCY OF INSECTS IN THE FERTILIZATION OF FLOWERS.—There are few of us who have not been interested in the particular speculations, advanced by writers with a limited knowledge of plants, in regard to the agency of insects in the fertilization of flowers. According to these speculations, color and fragrance have been made the attributes of flowers, solely that insects may be attracted, and thereby insure cross-fertilization. The insect is supposed to carry pollen from the flowers of one plant to the flowers of another, and it is further supposed that the progeny of these crosses have a greater power in what is called "the struggle for life" than plants which originate from self-fertilization. Those, however, who look closely into the nature of flowers, find very much that cannot be explained by these speculations. For instance, the willow is a plant that bears male and female flowers on separate plants. Female flowers have no fragrance, and yet they are visited by bees, probably just as freely as if the flowers were ever so sweet. The male flowers, on the other hand, have a delightful fragrance, —bees visit them also with freedom. As a general rule, bees that collect from the male flowers seem to collect from these male plants only. Usually, individual bees seem to work wholly on the female flowers,—and, as bees visit the sweet flowers and the scentless flowers indiscriminately, what [illegible] the odor of the male have to do with questions of cross-fertilization? This seems equally true of color. A large [illegible]ber of sweetest flowers are extremely insignificant as regards color,—while numbers of the most showy flowers have scarcely anything that would invite nectar loving insects. It may be granted that color and fragrance may have some little influence in attracting insects; but these characters certainly can have no great place in building up a speculation as to the great changes in plants involved in theories of cross-fertilization.

INJURY BY LOSS OF LEAVES.—Mrs. Frederick C. Johnson, Crete, Illinois, says:—"On our farm in Adams Co., Nebraska, May, 22, 1893, a hail and wind storm took every leaf from the trees in our orchard, many were in bloom, but after the storm the trees were as bare as in winter. They leaved out again, and the middle of June, another hail storm left them leafless. We feared the trees would die this time, but they again sent out their green robes, seemingly bound not to give up to the elements, and, by July 9th, they were in full leaf again, when the third hail storm not only took leaves but small branches and tore the bark in strips on the side towards the storm. After this, over half of the trees died. The others, later varieties, still clung to life, and a few even blossomed in the autumn; but the succeeding spring nearly all were dead."

Lessons of great value to the cultivator are to be drawn from these experiences. It has been taught that any weed can be easily eradicated by cutting away all its leaves two or three times a year. Even such pernicious subjects as the Poison Vine, Canada Thistle, or the Horse Nettle can be effectually removed by a very little labor, earnestly applied. As we see in Mrs. Johnson's case, even trees can be killed by the loss of leaves in a single season.

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The *Lupinus albus* of Linnæus,—the old white lupine native of the South of Europe, is a different species from the American species in question. It was simply a white variety. Almost all blue flowered native plants have occasional white flowered sports.

NEST OF THE CHIMNEY SWIFT.—The Chimney Swifts have been very busy during the past week getting twigs from a number of old locust trees, whose tops are mostly dead. I first watched them on the seventeenth of May, between 6.45 and 7.30 P M. Sometimes they would make a tour of inspection, sometimes fly through without quite deciding; but generally the twig would be snapped while they hovered an instant,—and off they would go with it projecting on each side of the bill.

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Wesleyan Female Institute, Staunton, Va.

FORESTRY.

FORESTRY IN AMERICA.—The conductors of MEEHANS' MONTHLY have shown that forest fires can never be guarded against effectually by any amount of money spent on lazy forest wardens,—or by any amount of penalties imposed, so long as dead brush wood is suffered to invite conflagrations. Whether it is practicable to remove dead brushwood or not, has not been discussed. In some cases it would pay to do it, in some cases not. Possibly if the forest wardens were made to remove brush in the more dangerous locations, instead of reading dime novels in sentry boxes, some good might come out of the warden idea.

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The sorts planted were Yellow Locust, *Larix Europœa*, *Cupressus disticha*, *Juglans nigra*, *Castanea*, *Carya*, *Liriodendron*, ash, *Ailanthus*, *Quercus*, sumac and some others—quite 500 acres in all—now reduced to less than 100.

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ducing trees, but with those of cordwood production—a product valuable in the tidewater sections because water transportation can be readily obtained to the great cities. Such cord-wood growing back on the mountains, or elsewhere beyond cheap transportation, would be of little value; but in tidewater Virginia, within four or five miles of a shipping point, and on land worth $10 per acre, or less, it is valuable as it will develop at the rate of a cord per year, or 30 cords in 30 years, worth when cut and hauled to the river edge about $2 per cord."

Bristol, Pa. BURNET LANDRETH.

The next account is from the pen of the Hon. J. D. Lyman, of Exeter, New Hampshire, and appeared originally in the *American Cultivator*, the proprietors of which have kindly permitted us to use the cut which illustrates the article.

MR. LYMAN'S PLANTATION:—"In January, 1870, I bought the old, deserted Pike farm in New Durham for the wood and timber upon it. Some one, two or three years after, I noticed for the first time a clump of very thick, little White Pines (*Pinus strobus*) upon it. I asked Hon. I. P. Berry, who lives near by, if he would not like some bean poles, fence stakes and kindling wood. I showed him this clump of pines, and instructing him as to how I desired it thinned, he went to work, taking the thinnings for his pay.

The next year I saw that he had done the work admirably. Some five or seven years passed before I saw these trees again. I had neglected them too long. The trees were now standing too near together to grow as fast as I wanted them to gain. Their live tops were too small; in other words, they were somewhat stunted. Mr. Berry went to thinning again, and has thinned more or less at various times since.

The amount of poles, shingle stuff, fire wood and small timber which he has cut in the various thinnings, he thinks, is in bulk nearly equal to what is left standing. The thinnings have been worth more than it has cost to do the work. Had I owned these trees ten years earlier, and kept them properly thinned all the time, they would have been larger now.

On the twenty-third day of June, 1894, the diameters of these trees were measured four feet from the ground and found as follows: One tree, 22 inches in diameter; one tree, 22½ inches in diameter; 10 trees, 16 to 19 inches in diameter; 27 trees, 14 to 16 inches in diameter; 25 trees, 13 to 14 inches in diameter; 31 trees, 11 to 12 inches in diameter; 18 trees, 10 to 11 inches in diameter; 6 trees, 9 to 10 inches in diameter; 2 trees, 7 to 8 inches in diameter. Total, 121 trees. These trees, and one Canoe Birch, perhaps ten inches in diameter, stand upon 108 square rods of land, keeping the line when measuring eight feet outside of the pines.

To be more certain as to the age and height of these pines, in September, 1894, I cut one of the largest of the inside trees and one of the smallest. Of course the outside trees next the cleared land on one side of the clump are larger. I found this larger tree 19½ inches in diameter on the close sawed stump, and 80 feet in height, with 54 annual rings in the stump. The smaller tree was 11½ inches in diameter at the stump with 43 annual rings and a height of 72½ feet.

To still further test these trees I had the logs drawn to a common saw mill and sawed with a thick circular saw into waney-edged boards an inch thick. The larger tree made 364 feet and the smaller one made 136 feet of such boards.

As it may be interesting to know how this larger tree tapered from stump to top, and the number of years it was in gaining each 10 feet of its height, I give the following measurements of its diameters and number of annual rings at each 10 feet, commencing at stump.

Diameter on stump			19½ inches
"	up 10 feet	14	"
"	" 20 "	12⅞	"
"	" 30 "	12⅛	"
"	" 40 "	10¼	"
"	" 50 "	8½	"
"	" 60 "	5¾	"
"	" 70 "	3	"
Number of rings in stump			54
"	" " up 10 feet		46
"	" " 20 "		42
"	" " 30 "		37
"	" " 40 "		32
"	" " 50 "		24
"	" " 60 "		15
"	" " 70 "		8

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A WHITE PINE GROVE.

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THE CAMPHOR TREE.—It has been thought by some that this tree, a native of China, might be found hardy in some parts of our country. But in Florida it has been found as hardy as the orange, but not more so. It was killed by the extra cold of two seasons ago, just as the orange was. Camphor raising would not be profitable, though the trees were hardy.

ducing trees, but with those of cordwood production—a product valuable in the tidewater sections because water transportation can be readily obtained to the great cities. Such cord-wood growing back on the mountains, or elsewhere beyond cheap transportation, would be of little value; but in tidewater Virginia, within four or five miles of a shipping point, and on land worth $10 per acre, or less, it is valuable as it will develop at the rate of a cord per year, or 30 cords in 30 years, worth when cut and hauled to the river edge about $2 per cord."

Bristol, Pa. BURNET LANDRETH.

The next account is from the pen of the Hon. J. D. Lyman, of Exeter, New Hampshire, and appeared originally in the *American Cultivator*, the proprietors of which have kindly permitted us to use the cut which illustrates the article.

MR. LYMAN'S PLANTATION:—"In January, 1870, I bought the old, deserted Pike farm in New Durham for the wood and timber upon it. Some one, two or three years after, I noticed for the first time a clump of very thick, little White Pines (*Pinus strobus*) upon it. I asked Hon. I. P. Berry, who lives near by, if he would not like some bean poles, fence stakes and kindling wood. I showed him this clump of pines, and instructing him as to how I desired it thinned, he went to work, taking the thinnings for his pay.

The next year I saw that he had done the work admirably. Some five or seven years passed before I saw these trees again. I had neglected them too long. The trees were now standing too near together to grow as fast as I wanted them to gain. Their live tops were too small; in other words, they were somewhat stunted. Mr. Berry went to thinning again, and has thinned more or less at various times since.

The amount of poles, shingle stuff, fire wood and small timber which he has cut in the various thinnings, he thinks, is in bulk nearly equal to what is left standing. The thinnings have been worth more than it has cost to do the work. Had I owned these trees ten years earlier, and kept them properly thinned all the time, they would have been larger now.

On the twenty-third day of June, 1894, the diameters of these trees were measured four feet from the ground and found as follows: One tree, 22 inches in diameter; one tree, 22½ inches in diameter; 10 trees, 16 to 19 inches in diameter; 27 trees, 14 to 16 inches in diameter; 25 trees, 13 to 14 inches in diameter; 31 trees, 11 to 12 inches in diameter; 18 trees, 10 to 11 inches in diameter; 6 trees, 9 to 10 inches in diameter; 2 trees, 7 to 8 inches in diameter. Total, 121 trees. These trees, and one Canoe Birch, perhaps ten inches in diameter, stand upon 108 square rods of land, keeping the line when measuring eight feet outside of the pines.

To be more certain as to the age and height of these pines, in September, 1894, I cut one of the largest of the inside trees and one of the smallest. Of course the outside trees next the cleared land on one side of the clump are larger. I found this larger tree 19½ inches in diameter on the close sawed stump, and 80 feet in height, with 54 annual rings in the stump. The smaller tree was 11½ inches in diameter at the stump with 43 annual rings and a height of 72½ feet.

To still further test these trees I had the logs drawn to a common saw mill and sawed with a thick circular saw into waney-edged boards an inch thick. The larger tree made 364 feet and the smaller one made 136 feet of such boards.

As it may be interesting to know how this larger tree tapered from stump to top, and the number of years it was in gaining each 10 feet of its height, I give the following measurements of its diameters and number of annual rings at each 10 feet, commencing at stump.

Diameter on stump		19½	inches
"	up 10 feet	14	"
"	" 20 "	12⅞	"
"	" 30 "	12⅛	"
"	" 40 "	10¼	"
"	" 50 "	8½	"
"	" 60 "	5¾	"
"	" 70 "	3	"
Number of rings in stump		54	
"	" up 10 feet	46	
"	" 20 "	42	
"	" 30 "	37	
"	" 40 "	32	
"	" 50 "	24	
"	" 60 "	15	
"	" 70 "	8	

As these trees stand at the rate of 217 to the acre, my estimate is that they will make at the rate of 50,000 feet of waney-edged inch thick boards to the acre. I think the sawing of the two trees cut and sent to the mill proves that an acre of such pines will make about 50,000 feet of inch round-edged boards, and that an acre of such worn-out farm land will grow nearly or quite 1000 feet of inch boards on the average for the first fifty years from the seed, beside the small stuff cut out in thinning. To be on the safe side I will keep to my old estimate of 50,000 to the acre in sixty years from sowing the seed.

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INTENTIONAL SECOND EXPOSURE

GENERAL GARDENING.

A BIRDLESS TERRITORY.

The Summer came, and all the birds were dead;
  The days were like hot coals; the very ground
Was burned to ashes; in the orchards fed
  Myriads of caterpillars, and around
The cultivated fields and garden beds
  Hosts of devouring insects crawled,
    and found
No foe to check their march, till they had made
The land a desert without leaf or shade.

—LONGFELLOW.

PROGRESS IN ALGERIA.—Algeria is the California of the Old World. A paper by Mr. Charles Crahay, now before us, reads exactly as if read before some eminent society in our Golden State, if only English instead of French were employed. There is the same comparatively dry climate, the same freedom from frost, and a set of nomadic natives to deal with as the original settlers found in California. In Algeria they are largely indebted to Australia for their best winter trees. The Blue Gums and the Acacias seem providential to them. It reads like California in every line. The introduction of the Eucalyptus has dried up malarious swamps, and transformed an insalubrious country into one of special healthfulness. The cultivation of cereals, and of many varieties of fruits and vegetables have become important interests in the Colony. Forestry is receiving especial attention since the various species of *Eucalyptus* or Australian gum trees are found so well adapted to the country. The gum trees were first introduced into Algeria by M. Rawel in 1862. They are not ornamental trees simply, but have a grand effect, says M. Crahay, when grown in masses as forests. They are very valuable honey plants,—and bee-keeping is getting to be one of the famous Algerian industries. The most rapid growing, and eventually the largest kind, is *Eucalyptus amygdalina*, called Karri by the Australians,—but the common Blue Gum, *Eucalyptus globulus*, is the best known through being the earliest kind introduced. But M. Crahay regards the Red Gum, *Eucalyptus rostrata*, as on the whole the most valuable for Algeria. There are several species known as Red Gum. To avoid confusion he would call this the Murray Red Gum, from the districts in Australia where it chiefly abounds.

It is surprising what a wonderful influence the Australian gum trees have had in so many parts of the earth in the short period of 100 years,—for the first species was discovered in Tasmania, by Labillardiere, in 1792. It has carried with it other Australian trees, which but for it, would probably have been still little known outside of Australia. Mr. Crahay enumerates the following trees of that country which are found to be of great value to Algeria. *Acacia Farnesiana*, *A. eburnea*, *A. melanoxylon*, *A. leiophylla*, *A. pycnantha*, *A. cyanophylla*, *A. decurrens*, *Casuarina equisetifolia*, and other species,—*Grevillea robusta*, *Schinus Molle*, the pepper tree of California; *Sophora Japonica*,—*Ficus*, or figs in all the species,—all do well. The most remarkable fact is that among these trees foreign to that country, the American White Ash, *Fraxinus Americana*, is found to suit itself to the peculiar conditions of an Algerine soil and climate, and is becoming very popular for forest planting there.

ACHIMENES IN OUT-DOOR CULTURE.—Many plants much admired for greenhouse culture thrive admirably in the open air during summer in most parts of our country. We saw recently a long, narrow box in which was planted a beautiful blue flowered *Achimenes longiflora*, rarely seen outside of a hot-house. The box was placed, however, on the north side of a building and close to the wall. It evidently delighted in the warm shade, but would probably not be suited to a spot in the full sun-light.

RUST IN CARNATIONS.—Prof. Arthur has examined the fungus which causes the yellow-leaf rust in carnations, and finds it caused by a minute parasite which he has named *Bacterium dianthi*. It is propagated by spores, which enter the stomata, as is usual with the little organisms of this family.

THE SILVER MAPLE FOR AVENUES, AND NOTES ON OTHER TREES.—A recent visit to the country residence of Mrs. L. D. Morrell, at Torresdale, Philadelphia, forcibly impressed the writer with the fact that the Silver Maple makes one of the handsomest avenue trees where space for natural development is plentiful. The above mentioned residence is located on rather high ground, and is reached by a long driveway, sweeping around the hill and approaching the house from the rear. On either side, the roadway is lined with rows of this maple. The trees, although still comparatively young, are well developed and very effective. A little lesson, teaching us to always keep an eye to the future in our landscape workings, is is here brought to our attention. In several places along the drive, plantings of oaks, tulip trees and beeches have been made which have crowded the maples to a great degree. The maple is prone to draw up into the light, and in consequence, at these points they have not followed the natural beautiful development, but are tall, bent and devoid of lower limbs. This naturally disturbs the harmony of the rest of the avenue. As a whole, its beauty is very impressive. The driveway, in its manner of approaching the rear of the house, is a decidedly good feature, as it permits of an uninterrupted slope of lawn extending direct from the front porch.

The carefully kept grounds evidence a great interest in trees and plants on the part of its owners; and many beautiful specimens, rare and common, may be seen. Of the latter, we must note a profusion of large, noble-looking beeches, lindens and oaks.

Two very large specimens of Bhotan Pines ornament a portion of the grounds. At a rough estimate, they are probably thirty feet in height. Unfortunately, when this species attains considerable age it is liable to a disease which will finally carry it off. Spraying with some fungicide is suggested as a possible remedy.

A very large specimen of the *Cunninghamia sinensis* may also be seen. A rough estimate would place its height at thirty feet, with a diameter of six inches at the base. This tree has a slight protection in the winter from surrounding trees; and with its branches also tied up, it has been brought through to its present great size. Standing at a short distance from this is a large and symmetrical specimen of the Fern-leaved Beech. To see this plant, one would not fail to list it as one of the handsomest trees for lawn adornment.

Mrs. Morrell has been troubled to a considerable extent with borers in some lindens, and some of the trees have died through their ravages. The usual method of cutting and wiring them out must be employed in these cases.

THIN SHELL PECAN NUTS.—There are thick rind oranges and oranges with thin rinds, and indeed this is true of all fruits and nuts in a greater or less degree. It is the province of the fruit grower to select those with the thinnest skin or shell, when such thinness is desirable. This is always desirable in connection with nuts; everyone will dispense with nut-crackers at the dinner table if possible. It is said that by selection a variety of Pecan nut has been secured which has a shell so thin that it can be crushed easily between the thumb and fingers. A thin shell would be especially desirable in this kind of nut. It ought to be more preferable than even a thin shell almond.

CORN SMUT.—It is well known that the large masses of powdery black matter, so often troublesome as "smut" in Indian Corn, is a fungus; and that the dusty particles, floating from it when disturbed, are spores, as the reproductive germs of fungi are called. Prof. Arthur has definitely determined that these spores will easily retain vitality for a year but will germinate at once if they come in contact with the proper host plant and conditions. The practical remedy is to gather and burn the masses of smut fungus before it has matured the spores.

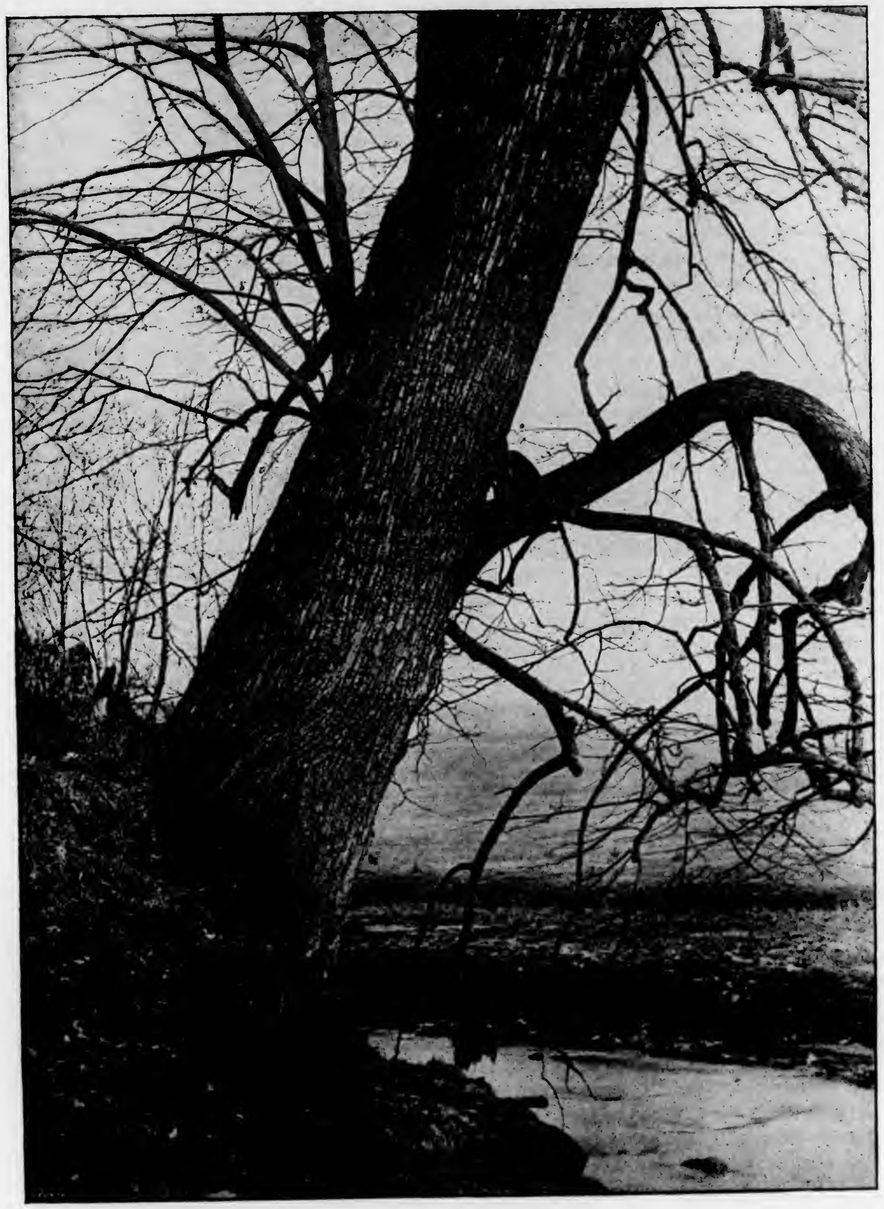
THE POND PARK AT HARTFORD.—Hartford seems likely to lose the grand park which Mr. Pond left by his will to the city. Some members of his family contested it. The reason given before the jury was that Mr. Pond sometimes drank to excess. The judge charged the jury that the law did not regard this as a fatal objection to the right of a man to make a will, but the jury thought otherwise. It is said there is yet a chance of the city getting the park, as the legality of the verdict is to be appealed to a higher court.

LINDEN BARK.—The bark of trees, equally with the wood of trees, is made of a number of annual layers; and the inner bark, or the layer the last formed, often presents beauty of structure which can be well examined when the pulpy matter is carefully washed away. The well known bast matting, which the residents of Northern Europe use for covering packages, and which is known as Russian matting, is the inner bark of the linden tree. Each species of tree has its own distinctive bark. The characters are so marked that a student might know a tree by the bark as easily as another could know a tree by its fruit. This is true of the outer appearance as well as of the inner character. Sometimes, indeed, a species closely related in the characters usually used for distinction, can be distinguished much better by the bark than in any other way. This is especially true in the case of the common European and the common American Linden. In the American Linden the rough bark takes the form of long narrow rifts, as shown in the annexed cut, on opposite page, which we have been kindly permitted by the publishers of *Forest Leaves* to use for the purpose of this illustration. The English Linden has a smooth bark for a much longer period, and the roughness is irregular. The differences are hard to describe, but readily appreciated by experience. What is true of the linden is true of all trees. One with due experience can distinguish one species from another by feeling the bark, at least as easily as by the ordinary botanical characters.

POLITICS IN PUBLIC PARKS.—During the last ten years, there has been marked attention to providing public parks or small open squares for the people in the greater majority of the larger cities of the Union; but much complaint is made that politics dominate to such an extent that very little real good is obtained from the tax-payers' money. It is frequently spent extravagantly, while the amount of pleasure derived from the expenditure is proportionately small. The writer of this paragraph has had some fourteen years experience as a legislator in one of the largest cities of the Union, and his experiences are,—for all the objection the American people generally have to Boards and Commissions—that their parks and pleasure grounds are more likely to be well managed under Boards and Commissions, than under the direct supervision of City Councils themselves. Politics will enter into Boards and Commissions just as much as they will into the management directly by the city; but the continual changes which follow this latter direct management are far more disastrous than even the influence of politics, in affairs of this kind. To have a good successful park or garden, there must be a regular plan to be carried out; but with incessant, and almost yearly, changes in management, what is done one year is upset the next; and there is far more waste through this, by the personal influence referred to, than in general politics. There is, however, always this in connection with parks and open spaces, that although they cannot be managed in the best possible interest of public wants, the open spaces in themselves are of value. It has fallen to the good pleasure of the writer to add nearly 1000 acres in numerous small parks for the city in which he resides; but although sometimes grieved that they are not, and probably will never, be managed as they might be for the best interest of the community, they will afford recreation to thousands. They are not what they might be, still they are of great value as they are.

LAWS AGAINST WEEDS.—One of our failings is to look to laws to help us in everything. No sooner is there some trouble, but legislation is appealed to. In the case of weeds, numerous enactments have been made by different State Legislatures. It would be interesting to know whether any instance is known of the weeds' progress being obstructed thereby. There is no excuse for trouble from any weed. Instead of praying to Jupiter, one's own shoulder to the wheel is usually sufficient.

HOT WATER FOR DESTROYING INSECTS.—It is given out as a new discovery that steam, allowed to fall to a temperature of 120°, will destroy insects. This is only repeating what was made public by the writer of this over forty years ago, that water heated to 120° was destructive of insect life, without being injurious to vegetation. The application, however, has been found rather troublesome, except where only a few plants are to be dipped in the water. People prefer insecticides that may be applied by powders or by spraying.



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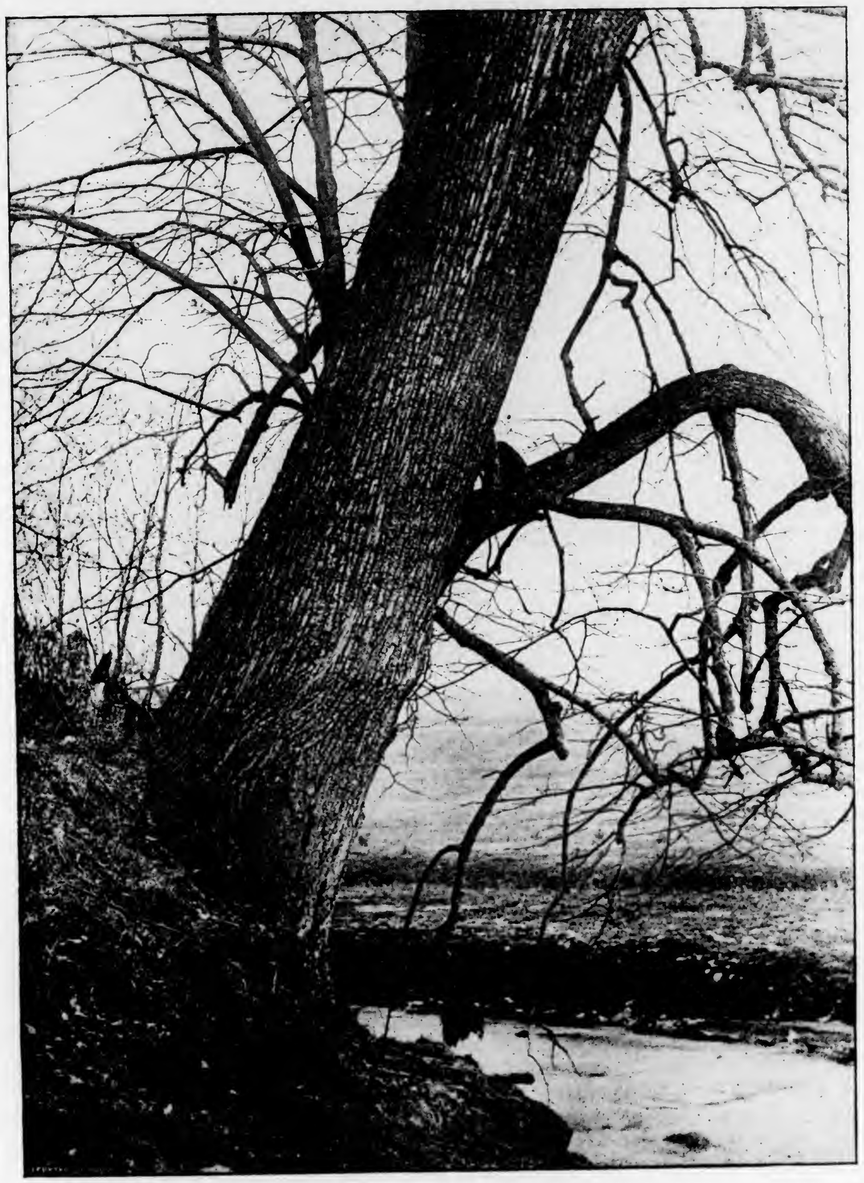

TRUNK OF TILIA AMERICANA.

INTENTIONAL SECOND EXPOSURE

THE WILD YAM, DIOSCOREA VILLOSA.—Miss Kate Clement, of Barnesboro, N. J., has a good word to say for the beauty of the wild yam, as an ornamental twiner. Under the name of Cinnamon Vine, its neighbor from Northern China, *Dioscorea divaricata*, (known also as *D. Batatas*, or Chinese Yam) is widely grown,—but is not equal in beauty, as Miss Clement remarks, to our native species.

THE COST OF GARDENING.—Some cynical people whose hearts are fixed on little else than pleasure and mirth and fashionable calls, sometimes have their little jokes on residents of the suburbs as to the cost of their gardens, flowers, fruits and vegetables. It may be true that occasionally the results to an amateur gardener may cost a little more than if he had to buy the article in the market; but amateur gardening is not always for the dollars and cents, but for the pleasure which gardening conveys. There is infinitely more pleasure in raising a a few crops of fruits and flowers than in riding to market to purchase them. We live for pleasure, and not for the accumulation of a little money. In fact, the only value of money is for the pleasure in life which we can get out of it.

DISEASED BLOSSOMS IN CARNATIONS.—Many growers of carnations know to their sorrow that some varieties will seem to give out after a few years of cultivation. One of these provoking changes is a deformity in the flower. The calyx splits and is frequently of a dropsical appearance. These troubles all come from attacks of minute funguses. Those who use solutions of copper have little trouble in keeping down these defects. Unfortunately, after some plants have been thoroughly infected with the fungus attacks, the trouble follows through succeeding generations, and this renders it necessary to keep a perpetual succession of new varieties. When once a carnation grower finds his flowers deformed, he may be pretty sure that the propagation of any plants, although they may appear healthy, growing in the vicinity of the diseased one, will probably produce a diseased race. This trouble comes more than is generally supposed from the attacks of fungus on the roots. For this reason the carnation grower is most successful who has the chance of an occasional change of soil. If the disease appears among the plants as they are growing in the open ground, it is not safe to have the plants grow in the same locality the succeeding year.

NEW OR RARE PLANTS.

FLOWERING ONIONS.—An advertisement of *Alliums*, or flowering onion bulbs, in another issue, reminds us to remark on the rarity of these beautiful plants in our flower borders. They mostly come from Eastern Europe and Western Asia, and are therefore perfectly hardy, and take care of themselves very easily. Of the large number of species that might be grown to advantage in our gardens, only the following are seen and these but rarely,—*Allium Moly*, *A. senescens* and *A. flavum*. Some of our western species are well worth growing. There are at least fifty species that might be grown to advantage in ornamental gardening.

A DOUBLE WICHURIAN ROSE.—From Mr. W. A. Manda, South Orange, New Jersey, comes a branch of a new double, pinkish white variety of *Rosa Wichuriana*. It is certainly a little beauty, and will no doubt become popular.

IMPROVEMENT OF WILD FLOWERS.—In nothing is the proverbial patience of the German more exemplified than in the continual improvement of some common wild flower. Almost yearly some plant with which we have been familiar for many years is brought before us in the shape of numerous varieties in color or form.

Among the latest of these is our old-fashion Blue Corn Flower, botanically known as *Centaurea cyanea*. Many of us have known it in its native blue form for a long life time; now we have white, purple, pink, orange and variegated forms. They are being welcomed by the florist, as the cut flowers keep a considerable time without withering.

THE HART'S-TONGUE FERN.—Our great early botanical traveller, Pursh, discovered a few plants of the *Scolopendrium vulgare* in one of his travels through New York State. It is a very common fern in the north of Europe, but doubts have been entertained as to its being thoroughly native to our country. It has been occasionally found by others since his time, but it is still scarce. Mr. C. F. Saunders writes that in travelling through New York he stopped a day at Jamesville, in Onondaga County, and had the pleasure of finding it in that location. He states that in a beautiful, rich wood, near the village, where the limestone crops to the surface, he came suddenly on a number of plants growing in small clumps from under the out-cropping of limestone. It was almost hidden by the rich growth of *Cystopteris bulbifera* and other herbage. *Geranium Robertianum*, another common weed in the Old World, and which usually accompanies the Hart's-tongue, was also among the herbage surrounding the plants. The fern seemed to be confined to a little basin in the woods, but it was there in considerable abundance.

COSMOS MARGUERITA.

THE HARDY FLOWER GARDEN.

IMPROVEMENT OF THE COSMOS.—The note referring to the good work of Mrs. Theodosia Shepherd in improving the Cosmos was written for the information of the Conductors only. It seemed of so much public interest that we asked permission to publish it, and should have added the picture which is now presented here, as making our readers the better acquainted with this beautiful class of plants.

WILD FLOWERS IN GARDENS.—Dr. D. W. Beadle, of Toronto, says: "I wish that you would favor us, in your Wild Flower chapter in the MONTHLY, with directions for growing them in our gardens. Soon many of them will be annihilated if not preserved in our gardens. I have been successful with *Cypripedium spectabile* on the north side of the house. *C. pubescens* also, and am trying *C. arietinum*."

There is room for a first class book on the cultivation of American wild flowers, just such another as Mr. William Robinson has done for British flower gardens. There are some of our native plants that can take care of themselves anywhere. The flower gardener needs no directions in regard to these,—but a number of the fastidious require for each one almost special treatment, and a special chapter would in most cases be required for each one. As far as practicable the information shall be given as we go along.

JAPANESE IRISES.—Japanese irises are among the most useful of plants in the herbaceous border. Besides the many beautiful colors in which they exist, they bloom later than any other kind, prolonging the iris season from April till July. Although growing very well in any ordinary garden border, they delight in quite wet places. In some collections they are planted where it is practicable to flood them with water every few days, which results in vigorous growth and extra large flowers. All irises are moisture loving plants, and might be used in wet places where many other ones would not thrive. They are frequently pictured in Japanese river scenes.

THE WILD YAM, DIOSCOREA VILLOSA.—Miss Kate Clement, of Barnesboro, N. J., has a good word to say for the beauty of the wild yam, as an ornamental twiner. Under the name of Cinnamon Vine, its neighbor from Northern China, *Dioscorea divaricata*, (known also as *D. Batatas*, or Chinese Yam) is widely grown,—but is not equal in beauty, as Miss Clement remarks, to our native species.

THE COST OF GARDENING.—Some cynical people whose hearts are fixed on little else than pleasure and mirth and fashionable calls, sometimes have their little jokes on residents of the suburbs as to the cost of their gardens, flowers, fruits and vegetables. It may be true that occasionally the results to an amateur gardener may cost a little more than if he had to buy the article in the market; but amateur gardening is not always for the dollars and cents, but for the pleasure which gardening conveys. There is infinitely more pleasure in raising a a few crops of fruits and flowers than in riding to market to purchase them. We live for pleasure, and not for the accumulation of a little money. In fact, the only value of money is for the pleasure in life which we can get out of it.

DISEASED BLOSSOMS IN CARNATIONS.—Many growers of carnations know to their sorrow that some varieties will seem to give out after a few years of cultivation. One of these provoking changes is a deformity in the flower. The calyx splits and is frequently of a dropsical appearance. These troubles all come from attacks of minute funguses. Those who use solutions of copper have little trouble in keeping down these defects. Unfortunately, after some plants have been thoroughly infected with the fungus attacks, the trouble follows through succeeding generations, and this renders it necessary to keep a perpetual succession of new varieties. When once a carnation grower finds his flowers deformed, he may be pretty sure that the propagation of any plants, although they may appear healthy, growing in the vicinity of the diseased one, will probably produce a diseased race. This trouble comes more than is generally supposed from the attacks of fungus on the roots. For this reason the carnation grower is most successful who has the chance of an occasional change of soil. If the disease appears among the plants as they are growing in the open ground, it is not safe to have the plants grow in the same locality the succeeding year.

NEW OR RARE PLANTS.

FLOWERING ONIONS.—An advertisement of *Alliums*, or flowering onion bulbs, in another issue, reminds us to remark on the rarity of these beautiful plants in our flower borders. They mostly come from Eastern Europe and Western Asia, and are therefore perfectly hardy, and take care of themselves very easily. Of the large number of species that might be grown to advantage in our gardens, only the following are seen and these but rarely,—*Allium Moly*, *A. senescens* and *A. flavum*. Some of our western species are well worth growing. There are at least fifty species that might be grown to advantage in ornamental gardening.

A DOUBLE WICHURIAN ROSE.—From Mr. W. A. Manda, South Orange, New Jersey, comes a branch of a new double, pinkish white variety of *Rosa Wichuriana*. It is certainly a little beauty, and will no doubt become popular.

IMPROVEMENT OF WILD FLOWERS.—In nothing is the proverbial patience of the German more exemplified than in the continual improvement of some common wild flower. Almost yearly some plant with which we have been familiar for many years is brought before us in the shape of numerous varieties in color or form.

Among the latest of these is our old-fashion Blue Corn Flower, botanically known as *Centaurea cyanea*. Many of us have known it in its native blue form for a long life time; now we have white, purple, pink, orange and variegated forms. They are being welcomed by the florist, as the cut flowers keep a considerable time without withering.

THE HART'S-TONGUE FERN.—Our great early botanical traveller, Pursh, discovered a few plants of the *Scolopendrium vulgare* in one of his travels through New York State. It is a very common fern in the north of Europe, but doubts have been entertained as to its being thoroughly native to our country. It has been occasionally found by others since his time, but it is still scarce. Mr. C. F. Saunders writes that in travelling through New York he stopped a day at Jamesville, in Onondaga County, and had the pleasure of finding it in that location. He states that in a beautiful, rich wood, near the village, where the limestone crops to the surface, he came suddenly on a number of plants growing in small clumps from under the out-cropping of limestone. It was almost hidden by the rich growth of *Cystopteris bulbifera* and other herbage. *Geranium Robertianum*, another common weed in the Old World, and which usually accompanies the Hart's-tongue, was also among the herbage surrounding the plants. The fern seemed to be confined to a little basin in the woods, but it was there in considerable abundance.

COSMOS MARGUERITA.

THE HARDY FLOWER GARDEN.

IMPROVEMENT OF THE COSMOS.—The note referring to the good work of Mrs. Theodosia Shepherd in improving the Cosmos was written for the information of the Conductors only. It seemed of so much public interest that we asked permission to publish it, and should have added the picture which is now presented here, as making our readers the better acquainted with this beautiful class of plants.

WILD FLOWERS IN GARDENS.—Dr. D. W. Beadle, of Toronto, says: "I wish that you would favor us, in your Wild Flower chapter in the MONTHLY, with directions for growing them in our gardens. Soon many of them will be annihilated if not preserved in our gardens. I have been successful with *Cypripedium spectabile* on the north side of the house. *C. pubescens* also, and am trying *C. arietinum*."

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INTENTIONAL SECOND EXPOSURE

FRUITS AND VEGETABLES.

INTELLIGENCE OF INSECTS.—Vigor of growth during early development bars insects such as the Curculio and plum Gouger from effective work on plums. It is altogether possible that early rapid development of the Japan plums makes the small fruits destructive to the newly laid egg, destroying it or making it so unfavorable a place for deposit; the instinct of the insect causes it to avoid that class of plums. It is altogether possible that the strong sap-flow drowns it and the insects know it.

As a rule insects do their most effective and destructive work on immature growths, and injure fruits that lack vigor,—and this season's observation leads me to a firmer conviction of this fact. At this writing, the American class of plums grown in the West show but very few plums stung so as to cause the fruit to drop, rot, or be worthless later at the gathering period. But I find large quantities of fruit just well marked, and the skin in most instances just cut through. There they seem to have stopped, and, as in one or two other seasons past, we know well that their injury will be very little in the plum orchard this season. But conditions of growth have been favorable. The West passed through the worst drowth period yet known in its settlement for two years, resulting in very little top growth of trees and heavy root growth and development; and the foliage area now on vegetation and advanced stage of growth after a series of heavy rains and top development of trees is remarkable,—and the fruits on plum trees are far advanced making, as everything else, phenomenal growth. W. M. BOMBERGER.

Harlan, Ia.

This question of the comparative freedom of some varieties of plum from attack or injury from the Curculio, and their subsequent vulnerability, is one well worthy of investigation, and the interesting contribution of Mr. Bomberger fairly opens it. When the class known as the wild goose varieties of the Chickasaw were introduced, they certainly were not marked by the Curculio; yet the writer of this saw wild Chickasaws in North Carolina, growing in old fields, so completely attacked by the insect, that it was difficult to find a ripe fruit that was not prematurely rotting from the attack. In like manner the improved Beach plums were announced as free from the Curculio, and the announcement was honest. A tree on the grounds of the conductors, matured perfect plums for several years. The tree is still there,—and has an enormous number of fruit with scarcely a dozen perfecting, and these marked though the egg of the insect either failed to develop, or was not deposited in the cut made by the ovipositor of the insect.

Briefly the point to be investigated is this:—Classes of plums are from time to time introduced which for a time seem free from the attacks of Curculio, or do not suffer from their attacks,—but subsequently the same varieties suffer as all their predecessors have done. How is this temporary exemption and change to be accounted for?

STRAWBERRY BLIGHT.—Mr. A. Remington, Amy, Wis., inquires for the best remedy against the strawberry leaf disease. In olden times, when it was more the practice to grow strawberries in beds than now, the leaves were mown off about the end of July or beginning of August and burnt. This destroyed the spores of the fungus, and of course the opportunity for the fungus to spread itself. It is not so easy to do this under row-culture, as the loose leaves cannot be raked up as completely. The only remedy would be a spraying with copper solution early in spring,—about the time the fruit is fairly set.

THE BLACK CURRANT.—The Black Currant is a northern fruit, and though the plants do not seem to be affected seriously by summer's heat, the fruit is by no means tempting. Those who would enjoy a really delicious black currant should taste them when grown in higher latitudes. In those places they are often more delectable than the Red or White Dutch, and will not require a coating of sugar to tempt the palate with.

APPLE BEN DAVIS.—The Ben Davis Apple has been the subject of much lampooning on account of its inferior eating qualities. But it remains a great favorite with market goers. At times its eating qualities are good, and it is never wholly poor. It will probably hold its own for some time for popular planting.

CHANGEABLE CHARACTERS IN FRUITS AND FLOWERS.—A Vermont correspondent inquires whether the flowers of the cultivated plums are proterandrous,—that is to say whether the stamens mature before the pistils, or the pistils before the stamens—proterogynous. It has been demonstrated in recent years that in a large number of plants there is no regular rule. In our common fruits especially, it depends on the season which matures first. Stamens are excited under a comparatively low temperature long continued, while the pistil grows rapidly when the higher temperature is reached.

EXPERIMENTS WITH ONIONS.—Mr. S. A. Bedford, the superintendent of the Dominion Experimental Farm at Branden Experimental Farm, finds the onion a vegetable that seems particularly at home in that high northern region, and has the following to say about some experiments he made during 1895:

"Nine varieties of onions were sown in drills twelve inches apart. All germinated with one exception, viz., Giant Spanish Yellow. This year gives additional evidence that onions are one of the most paying vegetables grown. All varieties averaged over 400 bushels per acre, and as they usually command a good price, few vegetables will give the same return. Many growers leave onions too long in the ground, and the frost injures them before they are dried. It is best to pull them a little on the green side rather than to leave them to ripen in the ground. The best keeping onion of the varieties tested last year, was Large Red Globe, which when looked over in April 12th, 1895, were as sound as when stored. This year taking all points into consideration, Yellow Globe Danvers and Red Globe Danvers were the two best varieties.

Silverskin.—A medium-sized white onion of mild flavor, irregular in shape, and having a loose, moist skin, which will probably detract from its keeping qualities.

Red Wethersfield.—A red globe onion, much later in arriving at maturity than the others, and inclined to be thick-necked.

Yellow Globe Danvers.—Although not a very heavy yielder, its thin neck, and early ripening qualities, make it a variety that can always be relied on here, globe shaped, light yellow in color.

Yellow Flat Danvers.—A flat onion, similar in color to Globe Danvers, but later and more thick-necked than that variety.

Red Danvers.—A red globe onion of fine color and appearance, ripens early, and has a thin neck. One of the best varieties tested.

Southport Red Globe.—A red globe onion of good size, but has a tendency to thick-neck.

Southport Yellow Globe.—A yellow globe onion of good form and substance, a heavy yielder, and produces few thick-necked onions.

Mammoth Silver King.—A flat white onion of good flavor, but having the loose skin and irregularity of Silverskin, not desirable."

FORCING CUCUMBERS IN WINTER.—Mr. Albert Millard, gardener at Senator Cameron's "Lochiel Farms," is an expert at forcing cucumbers. His first crop matured about November 15th last, and the second about the first of February. At this writing, June 12th, there is still a good crop-showing with every prospect of its lasting for three weeks yet. Mr. Millard considers the old "Herman's Selected Telegraph" still the best variety for forcing purposes. Some of the fruit gathered this winter measured twenty-two inches long.

APPLE CULTURE.—In most parts of our country, the worst foe of the apple tree is the apple tree borer,—the larvæ of a beetle which enters near the ground. Its presence in the tree can readily be detected by the saw-dust-like material which it ejects during its progress, and which can readily be detected when looked for. Amateurs who have but a few trees should look after them occasionally. A wire ran into their runs will crush them. Pine tar and lard may be painted around the trunk near the ground to prevent their entrance.

TOMATOES IN FLORIDA.—A few growers in Florida are in a measure making up by their tomato crop the losses of former years on their oranges. The reports of the profits of the tomato crop for the past winter are something enormous, and it may be judged from the accounts given that they have been quite as plentiful as the orange in its past day. Many thousands of crates have been shipped away, and now it is thought that with this good experience even tomato growing may be overdone.

BIOGRAPHY AND LITERATURE.

TO AN OAK.

How glorious is the green above my head!
How far the branches reach, and outward spread!
How musical the sighing, sea-dewed wind
Reveals to leave its message sweet and kind!
How stormful-strong when tempests sweep above!
All quickly followed by the peace of love!
There morning dawns in golden beauty drest,
There, too, I see the gateway of the West;
Afar I hear the winding river flow,
And by the breeze the swelling ocean know;
I list the birds of summer clear and sweet,
The violet, my neighbor, I can greet;
The children come and play with shout of glee.
Oh, wonderful the world that's known to thee!

—Wm. Brunton, in *Christian Register*.

Botanical Names in Gardening.—It was, if memory be correct, Prof. Bailey, of Cornell, who sometime since expressed an opinion to the effect that he might perhaps agree to the wholesale changes of names proposed, speaking as a botanist; but he could not from the horticultural standpoint. It really does look more and more clearly that the botanist and the horticulturist will have to part company. It is found impossible for the nurseryman to change names in his catalogue that have become the current property of his customers and of the world. This will have to be conceded further in the case of marked varieties that the botanist insists are but forms of one species. For instance, the two forms of *Silphium* which have the stems run through the leaves, so that a half pint of rain water will be held as in a cup, were named *Silphium connatum* and *Silphium perfoliatum*. Botanists now refer the former name as but a mere synonym of the other. But, assuredly, if any nurserymen were to send the hispid round-stemmed one to a customer who had already the smooth square-stemmed one, there would be a sharp correspondence thereafter. In like manner, if a customer required the maples *Acer ginnale* and *Acer nigrum*, and the nurseryman responded with the Tartarian and the common Sugar, there would be a storm. And yet in *Index Kewensis*, *Acer Ginnale* is given as the same thing as *Acer tataricum*, and *Acer nigrum* as the same with *Acer saccharinum*. It is probably right, from a botanical point of view, that these names should be regarded as mere synonyms; but the horticulturist cannot afford to follow. The trouble will be how to distinguish the botanical from the horticultural department of nomenclature.

The Story of Aquilegia.—The New York *Independent* notes:—"In the modern descriptions of plants their popular histories find a place alongside of their more substantial characters. The author of a recent paper on the columbine gives good reasons for the belief that the botanical name Aquilegia is not derived from either *aquila*, an eagle, or *aquilegium*, a water pitcher, as botanical writers have generally assumed. He contends that Aquilegia is the full name of a daughter of Jupiter, who was in love with the beautiful eagle which Ganymede rode in his courting excursions, and who died for the love of that bird when Ganymede, discovering the transfer of the lady's affection for himself, hid the bird when on visits to her. The gods, with their usual pity in these heart-broken cases, changed her into the flower which now bears her name. Aquilegia may, therefore, be construed as given to or for an eagle. The matter has a new interest in connection with the fact that a society has been formed to induce the selection of the columbine as the national flower. This should please the American eagle."

Rudbeckia speciosa.—Dr. Gray decided that the *Rudbeckia fulgida*, long known as such,—and as such figured in Meehans' "Native Flowers and Ferns of the United States," is really *Rudbeckia speciosa*, and we have since been calling it under this changed name. But we note that it is in bloom early in June while the *Rudbeckia speciosa* is credited with "August and September." It does seem as if there is a little clearing up yet to be done. The *Rudbeckia Missouriensis* is said to be but a form of *R. fulgida*.

Impressions of Scenery.—A correspondent of the *Independent*, New York, says that "the Kew Gardens is a favorite resort with the people now. Every one used to go to Richmond, another beautiful suburb, which is still popular, though somewhat changed. This section had always been noted for the beauty of its scenery. It will be remembered that when Jennie Deans, accompanied by the Duke of Argyle, paused for a moment on the brow of Richmond Hill to gaze on the unrivaled landscape presented to her view, the Duke said to her: 'This is a fine scene; we have nothing like it in Scotland.' To which remark the matter-of-fact Jennie replied: 'It's brar rich feeding for the cows, and they have a fine herd of cattle here; but I like just as well to look at the crags of Arthur's Seat, and the sea coming in against them, as at a' the muckle trees'"

But it does not follow that chance expressions like this attributed to Jennie Deans, are true indexes of individual character. When the writer of this was but a small lad, the famous William Cobbett was a visitor to his father's grounds. When he was invited to come around to the front of the house to be shown a "beautiful sea view," he hastily replied "I care nothing for sea views; the land views alone concern me." But he was so intent, at that moment, in trying to induce the folks to experiment with "Cobbett's corn," as he had newly christened our six weeks Indian corn, that his real disposition was momentarily obscured. Cobbett really did admire fine sea views.

Tacoma.—Residents of the northwest coast are exercised about the name of the great mountain known in geography as Mt. Ranier, but which they insist shall be called Tacoma. Vancouver was the first geographer who saw it, and under geographical rules had the right to give it a name. He named it after a friend in the Old World named Ranier. The Indians had long ago known it as Tacoma, and the effort is to set aside the geographical name in favor of its ancient Indian one.

Mt. Tacoma is possibly one of the most remarkable of mountains. The glaciers which flow from it are among the most wonderful in the world. It furnishes the water for a large number of western rivers.

Those who are well versed in Indian history conclude that the Indian inhabitants of this part of America came from Alaska, and that from this point the immigration was southwardly until they eventually settled ancient Mexico and Peru. That the Indians of Alaska came from Asia is pretty clearly settled now. The line of their journeyings seems to have been all along the Pacific coast. Tradition among the Alaska Indians, describing the country from which their forefathers came, seems to fit Kamtschatka so clearly that there is little room now for doubt of the Asiatic origin of the Indian race.

The American Crab Apple as a National Flower.—I notice in your June number (page 108), your Georgia correspondent proposes the Wild Crab Apple as the national flower.

I think I have seen it proposed before, and of the flowers which I find in this locality it certainly would be my choice. I should be pleased to have you bring it before the public as it seems so much more appropriate.

Virginius H. Chase.

Wady Petra, Ill.

American Grape Growing and Wine Making, by George Husmann, New York, Orange Judd Co.—This is the fourth edition—a fact which of itself speaks for the value of Mr. Husmann's work. There has been so much of interest developed in grape culture during the few past years, that a new edition now makes this old standard treatise as good as new in every respect, while better than new in many progressive points.

A Large Pitcher Plant.—In reference to *Sarracenia purpurea*, Mr. Willard N. Clute says:—

"While collecting at Lily Lake, near Dalton, Pennsylvania, on May 30th last, I found one of the largest, if not the very largest, pitcher plant on record. When found it had eighty-five perfect "pitchers," with many more forming. I believe the largest plant heretofore recorded in Meehans' Monthly had but seventy."

Familiar Trees, and Their Leaves.—This is an admirable work for those who love trees, and are not trained botanists. Two hundred illustrations are given. It is prepared by F. Schuyler Mathews, and published by D. Appleton & Co., New York.

GENERAL NOTES.

AMERICAN LUPINES.—The following pleasant notice of our magazine from the Joliet (Illinois) *News*, is so instructive as regards members of the Lupine family in that section, that it is reproduced here :—

"MEEHANS' MONTHLY is a magazine that would be a delight to many of our readers, for it treats of general gardening and the wild flowers. The wild flowers are given a prominent position. Strangely, flower growers better understand the names and habits of imported plants, though less attractive so far as beauty goes, than they do a large number of the most choice of our wild plants. The present number of this magazine has a full page illustration in colors of one of the most beautiful of the lupines. It is found in abundance along the line of the Michigan Central between Joliet and Lake Station, in the sandy soil on the edge of Indiana. It is a very dark blue, indigo blue in color, resembing somewhat the blossom of a pea, and is often gathered in great quantities for use here on Decoration Day. This is the Sun Dial Lupine, or, as the scientists have it, *Lupinus perennis*. It was named at a time when it was supposed to be the only perennial in that family. There are several, however, in this vicinity—one having white or cream colored blossoms and another having white and pink mixed, known to old prairie farmers as shoe string. Lovers of wild flowers and ferns will find much delight in this magazine."

THE MOSQUITO PLANT.—The very pretty genus of mosquito plants, known as *Lopezia*, have flowers which in some degree resemble the winged insects from which its name is taken. One might also say that they present the appearance of a large mosquito. Moreover, there is a certain irritable movement in the stamens, which would almost suggest a thing of life. In some parts of the country, they have received the name of mosquito flowers, or mosquito plants. Beyond the form there is nothing else to suggest the mosquito. The flowers are in almost all the species of a very pretty rose color, and it seems rather far-fetched to compare them with this hateful insect; but there is no accounting for taste in the application of common names.

PINUS TÆDA.—Concerning *Pinus Tæda*, the "Short-leaved Pine," Col. M. B. Hillyard says of it as growing in Northwest Louisiana: "The Short-leaf Pine finds its best development in Northwest Louisiana, dividing honors with Northeastern Texas and Southern Arkansas. There it occurs 'in greatest abundance and perfection,' to quote the great authority. Some acres each will cut thirty thousand feet; fifteen thousand feet is quite common. Its great merits are well known to lumbermen."

POETS AND NATURE.—"Poets are all who love," says one of the class,—but there is a vast difference in the objects of their affections. We may follow some poets for all time, and not be led once into the woods and fields among the birds and flowers. But others are in warm contact with nature. Mrs. Seliger says, that among the ardent lovers of trees and flowers among German poets, Heine stands pre-eminent.

DAMAGED PLATES. — Several Complaints have recently been received that numbers of the MONTHLY are folded in the post-office department, the plates being injured for binding. If others have found cause for complaint on the same account, the publishers would be glad to hear of it that steps may be taken to prevent further trouble.

PENNSYLVANIA MOUNTAIN TEA. — Under this name the leaves of one of the Golden Rods, *Solidago odora*, are in very common use as tea, by the families of the German race in the interior of Pennsylvania. Men gather the leaves in the summer time, and many are said The to make a good living at the work. They peddle it in the winter time.

SITUATIONS WANTED.

Advertisements under this head, not exceeding 50 words, will be inserted once for 50 cents, or three times for $1.25.

GARDENERS:—We shall be glad to furnish names of competent gardeners adapted to large or small places. Gardeners wishing situations should correspond with us. THOMAS MEEHAN & SONS, Nurserymen, Germantown, Philadelphia.

GARDENER—Situation wanted by a man thoroughly experienced in all branches. Age 38, married, 2 small children. Excellent references. Address, J. W. B., care of MEEHANS' MONTHLY

GARDENER—English, aged 38, married, small family; 24 years experience in growing orchids, ferns, stove and greenhouse plants, roses, carnations, chrysanthemums; also the management of fruit houses, vegetable and flower gardens, etc. State wages. Chas. Dumper, 119 Tallmadge St., Poughkeepsie, N. Y.

AS GARDENER, by a man of experience and ability, will be disengaged 1st of March next, thoroughly conversant with the management of a gentleman's country estate, unexceptional references for ability and personal character.
Address, J. E. S.
Box 103
Toms River, N. J.

HEAD GARDENER—*Estate Manager*—Situation wanted by a theoretical and practical gardener, 27 years experience in Landscape work, cultures under glass or out-doors, all branches of gardening. Best references from *first-class* places. Europe and U. S. February or later, "R. F.," Office, Meehans' Monthly.

GARDENER. Situation wanted as gardener by a thoroughly practical English-American, single, 8 years experience as gardener and florist. Excellent references. Address,
E. A. C., Box 311, Tarrytown, N. Y.

GARDENER — Wants situation on private place, competent in all branches, by married man, age 34; three children, small; experienced in growing all greenhouse plants, highest reference for sobriety and integrity, five years in present place. M. B., care of Thomas Meehan & Sons.

THE NEW ST. LOUIS

While it is under new management, with new editors and new contributors, it is still the oldest and most reputable publication of its kind in the west, this being the twenty-sixth year of its age.

A $1.00 Magazine for 30 cents.

To any one sending us 30 cents and six names of friends who might subscribe for our magazine, we will mail our one dollar magazine a full year. At 30 cents we lose money the first year but hope you will continue to be a subscriber, after seeing twelve numbers. If you wish to see the magazine before subscribing, send 10 cents and receive a sample copy and a free gift of an aluminum dime-size charm, with the Lord's Prayer engraved in smallest characters; bright as silver, and never tarnishes. *We do not send sample copies free*, so save your postal cards as no notice will be given them. Subscription price, $1.00 per year. Address,

THE NEW ST. LOUIS, 2819 Olive St., St. Louis, Mo.

A Great Chance To Make Money.

I want to tell you of my wonderful success. Being a poor girl, and needing money badly, I tried the Dish Washer business, and have cleared $200 every month It is more money than I ever had before, and I can't help telling you about it, for I believe that any person can do as well as I have, if they only try. Dish Washers sell on sight; every lady wants one. The Mound City Dish Washer Co., St. Louis, Mo., will give you all necessary instructions, so you can begin work at once. The Dish Washer does splendid work; you can wash and dry the dishes in two or three minutes, without putting your hands in the water at all. Try this business and let us know how you succeed. ELIZABETH C.

Ice Cream Made by a New Process.

I have an Ice Cream Freezer that will freeze cream instantly. The cream is put into the freezer and comes out instantly, smooth and perfectly frozen. This astonishes people, and a crowd will gather to see the freezer in operation, and they will all want to try the cream. You can sell cream as fast as it can be made, and sell freezers to many of them who would not buy an old style freezer. It is really a curiosity, and you can sell from $5 to $8 worth of cream and six to twelve freezers every day. This makes a good profit these hard times, and is a pleasant employment. J. F. Casey & Co., 1143 St. Charles St., St. Louis, Mo., will send full particulars and information in regard to this new invention on application, and will employ good salesmen on salary.

The Rose: Its Cultivation, Varieties, etc.

BY H. B. ELLWANGER.

Directions for cultivation, for planting, pruning, propagation, the treatment of diseases and insect enemies, particularly valuable for its classification, alphabetical and descriptive list of nine hundred and fifty-six varieties. Cloth, 16vo. Price, **$1.25.**

THOMAS MEEHAN & SONS, Germantown, Pa.

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2819 Olive Street, St. Louis, Mo.

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Is the name of our **SUPERIOR HOSE COUPLING**

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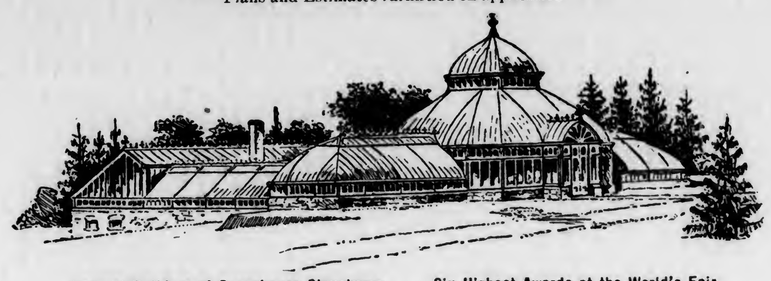

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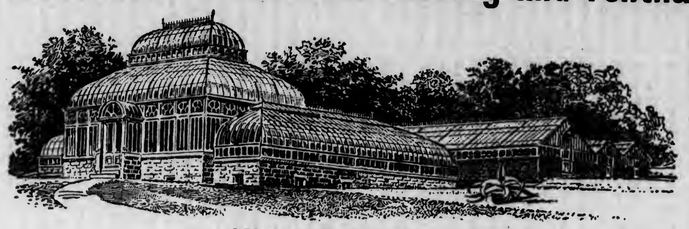

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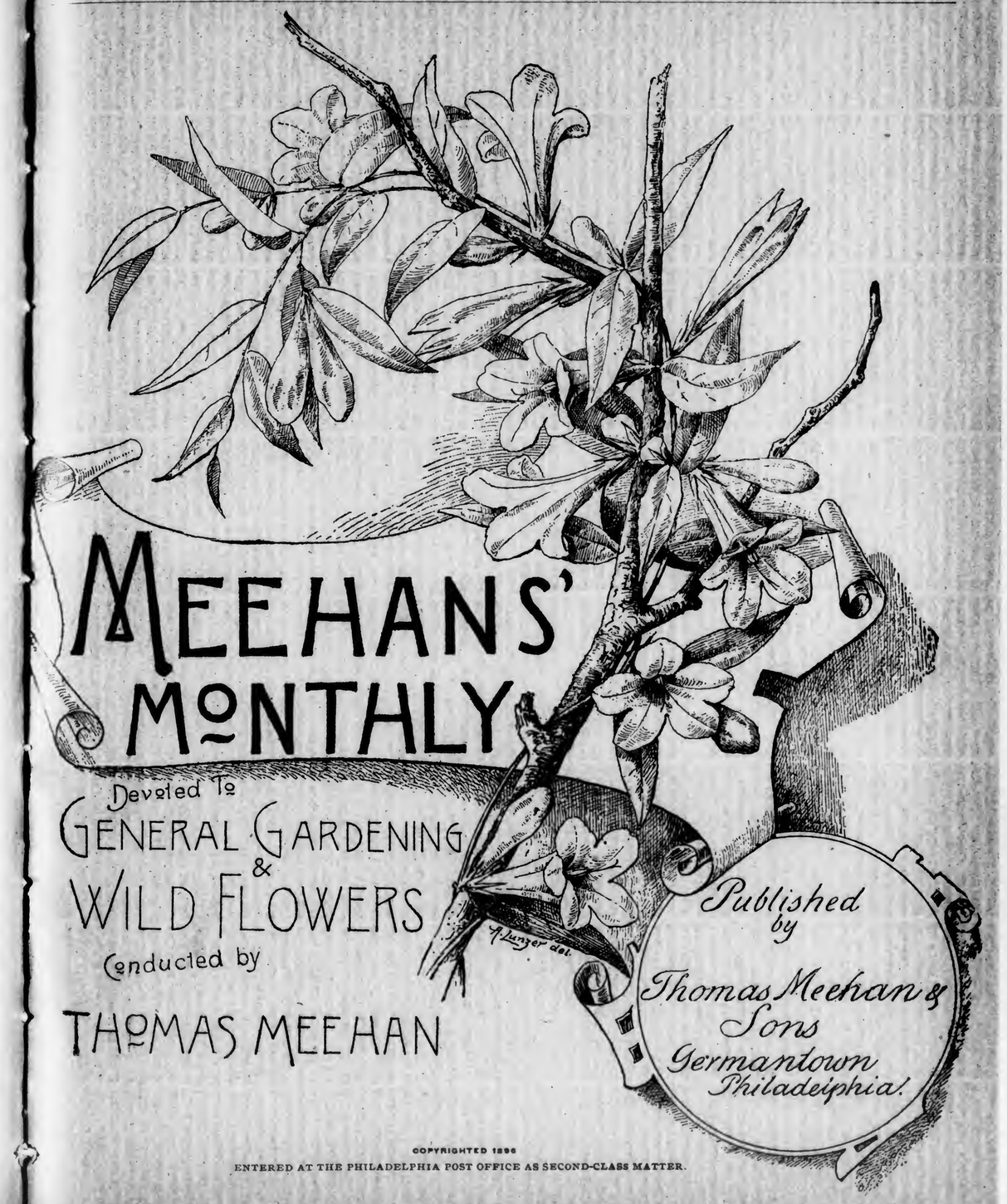

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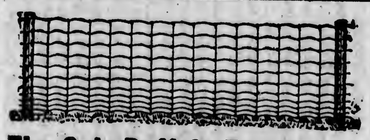

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The freckled cowslip, burnet, and green clover,
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Conceives by idleness; and nothing teems,
But hateful docks, rough thistles, kecksies, burs,
Losing both beauty and utility."

Not always in history, however, has the thistle been despised. It is the national emblem of Scotland, this honor having been bestowed on it by the Stuarts, James the IV and James the V. It appeared on Scottish coins first in 1514, with the motto "No body offends me with impunity." This honor was founded on an old legend connected with the early history of Scotland. Achains, a Scottish King, had used it in memory of a defensive league between himself and Charlemagne, the French Emperor, and founded an order of nobility thereon, the order of The Thistle or of St. Andrew. The original incident was said to have been that in one of the early wars a soldier of the Danish forces trod on a thistle, and crying out with pain, betrayed the presence of the enemy to the Scottish troops on which they obtained the victory. No one knows what species of thistle it was, and some have denied the whole story. It may not have been a thistle at all, even if the legend were genuine, as any rough seed vessel that could be used in carding wool, was a thistle. The teasel is used for this purpose to this day, and the two names have probably the same origin. Those poets who love to trace in the habits of flowers types or emblems of the passions or emotions of humanity, connect the thistle with austerity or misanthropy. This of course is suggested by its spiny character, which leads even those who may admire it to leave it alone; and the emblematic ideal is not so much

CIRSIUM DISCOLOR.

TWO-COLORED—LEAVED THISTLE.

NATURAL ORDER, COMPOSITÆ.

CIRSIUM DISCOLOR, Muhlenberg.—Stem two to five feet high, with rather slender leafy branches, pubescent with crisped membraneous hairs; leaves three or four to twelve or fifteen inches long, those on the branches small, all pinnatified smoothish and green above, densely tomentose and bluish-white beneath; heads ovoid-oblong, one to two inches in length; florets reddish-purple; anthers whitish. (Darlington's *Flora Cestrica* under the name of *Cirsium discolor*. See also Gray's *Manual of the Botany of the Northern United States*, Chapman's *Flora of the Southern United States*, and Wood's *Class-Book of Botany*.)

The name, thistle, has come to be a term of reproach. A thistle would generally be regarded as a weed and not a flower, in the popular acceptation of the term. Flowers we may love and care for, but weeds we generally despise. But this character has been given to thistles perhaps from a misconception. When it was said that the land should henceforth bring forth thorns and thistles, it was only in the event of man not tilling the ground. If man neglects to do his part in cultivating the ground, the thistle should have a right to make use of the soil which man neglects to turn to proper account. If we will allow ourselves to look at a thistle while forgetting early prejudices we shall find much to claim our admiration. Certainly the species we now describe is always attractive though struggling with stronger vegetation in neglected places; but when it is found in an open place, where the branches have a chance to develop without being crowded by other things, it may be termed a beautiful object when in full bloom. Indeed its crowding into unoccupied ground is in many cases a merit, as Withering, a worthy English botanist of the past age, pointed out of thistles generally. There are often tracts of barren clay on which scarcely anything will grow; but the thistle is not fastidious in its selection of food; and, carried by the light thistle-down, the seeds find themselves on these places and the plants thrive, preparing in time the soil for other more delicate things which could not exist there but for the work of the thistle in the first place. The connection of the thistle with man's neglect has often been a subject of poetical association. Shakespeare, in Henry V., brings the English and French princes and princesses together to celebrate the return of peace to their several countries. The Duke of Burgundy, sketching the miseries of war, remarks:

"The even mead, that erst brought sweetly forth
The freckled cowslip, burnet, and green clover,
Wanting the scythe, all uncorrected, rank,
Conceives by idleness; and nothing teems,
But hateful docks, rough thistles, kecksies, burs,
Losing both beauty and utility."

Not always in history, however, has the thistle been despised. It is the national emblem of Scotland, this honor having been bestowed on it by the Stuarts, James the IV and James the V. It appeared on Scottish coins first in 1514, with the motto "No body offends me with impunity." This honor was founded on an old legend connected with the early history of Scotland. Achains, a Scottish King, had used it in memory of a defensive league between himself and Charlemagne, the French Emperor, and founded an order of nobility thereon, the order of The Thistle or of St. Andrew. The original incident was said to have been that in one of the early wars a soldier of the Danish forces trod on a thistle, and crying out with pain, betrayed the presence of the enemy to the Scottish troops on which they obtained the victory. No one knows what species of thistle it was, and some have denied the whole story. It may not have been a thistle at all, even if the legend were genuine, as any rough seed vessel that could be used in carding wool, was a thistle. The teasel is used for this purpose to this day, and the two names have probably the same origin. Those poets who love to trace in the habits of flowers types or emblems of the passions or emotions of humanity, connect the thistle with austerity or misanthropy. This of course is suggested by its spiny character, which leads even those who may admire it to leave it alone; and the emblematic ideal is not so much

COLOR PHOTO

strained as it very often is by writers of this class.

In most of our text-books this plant is described under the name of *Cirsium discolor*. Both this and *Cnicus* are very old names for these plants, but the more modern botanists do not regard the differences sufficient to distinguish the two genera, and *Cirsium* is abandoned ; *cnicus* is from the Greek, and signifies to bite or to prick, and is a very characteristic name for most of the species of the genus, when we consider the spiny character most of them possess. Thistles are very numerous throughout most of the temperate regions of the world. The United States has about thirty species, besides a few that have been introduced. Webster, in his dictionary, has with all the care bestowed on that work an evident misprint in making *Cnicus lanceolatus* "indigenous" instead of introduced. Some few thistles have been used as food, and reputed useful in medicine, but on the whole they would be considered a useless tribe of plants. The bee would, however, object to this decision. It is a favorite pollen plant for this industrious insect, a fact noted even in Shakespear's time. In "Mid-Summer Night's Dream," Bottom directs his French friend as to the luxuries he is to bring:

"Good monsieur, get your weapons in your hand, and kill me a red-hipped bumble bee on the top of a thistle ; and, good monsieur, bring me the honey bag."

Whether the honey in the bag was from the same kind of plant as furnished the mass of red pollen the bee's hip was loaded with may be a question. As far as the writer has been able to conclude, a bee engaged in collecting pollen or honey, continues at this work for some time, and does not collect either indiscriminately as it comes to it. It may sometimes collect honey from thistles,—but its great attraction is the pollen.

The peculiar arrangements of thistles in connection with composite plants generally have been a matter of interest to those engaged in the study of the relations of plants to insects. It is, however, by no means certain that we should regard every form in vegetation as being constructed with an especial view to individual benefits. For instance in many plants of the order compositæ the ray florets are very conspicuous while the disc florets have little to attract them. It would be pardonable to compare ray florets in such cases to little flags held out for the plants benefit, to attract insects to the humbler disc flowers,—but we see kinds with no ray florets making their way just as well. There seems to be no reason why all the florets should be showy, as in our thistles. In like manner there have been discussions on the way the florets are fertilized. The pistil pushes up between the connected set of anthers, carrying pollen with it, as in our Fig. 6. In time the pistil divides, exposing two stigmatic surfaces ; but not before all the floret's own pollen has been lost, except such as may adhere as seen in this same Fig. 6. It is therefore assumed that the fertilization must occur from the pollen from another floret, and this is regarded as an arrangement for cross-fertilization. But in thistles these stigmatic lobes never open, but remain always as in Fig. 6, and yet the florets are as perfectly fertilized as are the average of flowers of the order. It seems as safe to say that the peculiar forms of flowers are arranged as much for variety in nature as that any special benefit to an individual is to result from any particular form.

In 1876 Dr. Asa Gray, in his final revision of North American thistles, gives the geographical range of the species we are now illustrating as from "Canada to Illinois, and southward along the upper country." Its next neighbor, *Cnicus altissimus*, was early discovered, and is thus more extensively referred to in botanical literature, but it is scarcely so abundant nor so well fitted to represent a purely American thistle, but very few of our native species are abundant in any one spot.

Darlington and Michener include it in their treatises on weeds especially worthy of attention from American farmers. Thistles of all kinds are considered bad weeds for farmers, because their seeds may be floated long distances by their coma or down. But the seed of this species is too heavy to be carried far by this frail agency,—and as the plant is an annual, large, and does not flower till late in the fall, only the very slovenly farmer would let it stand long enough to seed again.

EXPLANATION OF THE PLATE.—1. Part of a stem and stem leaf. 2. A branchlet with flower. 3. Interior involucral scale. 4. Floret. 5. Upper portion of pistil, showing the permanently united lobes, with adherent pollen.

WILD FLOWERS AND NATURE.

SEPTEMBER.

The morrow was a bright September morn ;
The earth was beautiful as if new-born ;
There was that nameless splendor everywhere,
That wild exhilaration in the air,
Which makes the passers in the city street
Congratulate each other as they meet.
—LONGFELLOW.

POISONOUS PARSNIPS.—Mr. Chas. H. Lochman has a paper in June *Popular Science News*, from which we take the following : "Dr. Fred B. Power, assisted by one of his pupils, J. T. Bennett, in his experiments, gives an account, in a contribution to the *Pharmaceutische Rundschau*, New York, July, 1891, of investigations to determine whether the frequent reported cases of poisoning by the wild parsnip were true, or whether, as he suspected, they were caused by other umbelliferous roots, which were mistaken for the parsnip.

The chemical examination made by Mr. Bennett failed to detect the presence of any poisonous principle in the root of the true wild parsnip, and when boiled were fed in considerable amounts to a cat, and no symptoms of poisoning were manifested. About the same time an independent contribution to the subject was made by Dr. J. J. Brown, of Sheboygan, Wis., in which he says : 'Just north of my home on the lake is a patch of wild parsnips, still holding the fort of an abandoned garden, belonging to the cabin of an 1836 pioneer. These parsnips have grown there and run wild to my certain knowledge about forty years—and, no doubt, for nearly fifty years—yet my faith in their innocence was such that a few days ago I dug enough for a good dinner, which I ate, and can testify that I could discover little or no difference, *either cooked or raw*, between these that have run wild for fifty years and those now cultivated in my garden.'

Dr. Kremers, an associate of Dr. Power, gave 3½ ounces of finely cut raw wild parsnip root to a small dog, who experienced no symptoms whatever of poisoning, and in fact, the doctor himself ate half of a raw root without experiencing any ill effects."

The Senior Conductor of MEEHANS' MONTHLY has eaten parsnip roots, and has known others to eat them, without the slightest injurious effects. Always interested in the question, he has taken special pains to investigate cases. In the Danville, Pa., cases, he knew well the physician in attendance, Dr. Schultz, who was also an excellent botanist. He sent the roots,—some of which had been partially eaten, with the mark of the childrens' teeth on them. The crowns were good, and were planted. They proved certainly the common parsnip.

There was no mistaking something else for it. How are we to account for these varying results. If we are not mistaken, even the water parsnip itself has been tested, as the tests above cited were made, with no serious results.

It is worth inquiry as to how these differing results are to be accounted for. Ice cream is sometimes poisonous,—but this is by some deadly representative of the lower organization getting a chance to work. Can there be some similar explanation here ?

A MOSSY CUP OAK.—Dr. W. Saunders regards the Mossy Cup Oak (*Quercus macrocarpa*) as being one of the oak family to have a wide geographical range in the United States. It is found rather plentiful in Kentucky, while in Canada it is found in a number of localities between New Brunswick in the east, and Ft. Ellis in the northwest. It varies remarkably in size and general character. In some parts of the country it is known as the Scrub Oak, from its rarely reaching more than 15 feet in height.

ASPLENIUM PINNATIFIDUM. — Mr. C. F. Saunders finds this rare fern in York County, Pennsylvania, and a case where one of the fronds has assumed a rhizomatous character, as in the Walking Fern. These cases of transition between species—some would say reversion—are always of interest.

A PELORIA CONDITION OF THE YELLOW TOADFLAX.—Dr. S. P. Speese, of Lansdale, Pa., sends specimens of the common yellow toadflax, *Linaria vulgaris*, in what is known as its peloric condition. In this condition the flowers have several spurs instead of one, and the whole structure of the flower is changed. The specimens were rather small to make a good drawing from, so we have made use of a figure, given some years ago, in the London *Journal of Horticulture*, which represents exactly the condition in which it is occasionally found in America. The word "occasionally" is used, as it does not seem a common occurrence with us,—at least it has never been the good fortune of the writer of this to see a living specimen until this one kindly sent by Dr. Speese.

The Greek word *pelor* signifies a monster,—and the term peloria has been employed to designate the monstrous forms of flower, and of this toadflax in particular.

There is nothing more interesting than a study of the method employed by nature in constructing the various forms of flowers; and these monstrosities are always welcomed in these days, as they furnish the clue to much knowledge that can otherwise be only guessed at. We have come for instance, to conceive that all flowers are made up of many parts that might have been, but for the conditions surrounding them, pure green leaves. But life-energy unites parts that might have been separate, and thus what we call monopetalous or tubular flowers, are really made up by the union of distinct leaflets. The snapdragon, or toadflax, which seems so solidly of one piece for all its wide-gaping mouth, we come to believe is really made up of five distinct pieces, which in early infancy became united. The lower lip, which has the palate, should have been of three pieces, and the upper, arching segment, is of two. The peloria condition is a reversion towards the original. An arrested degree of vital energy has permitted a separation of the parts usually united, and we have four or five petals with spurs, as if it were an *Aquilegia*, or columbine. This does not mean that a columbine and a toadflax, or snapdragon, are near relatives, that the reversion is towards the columbine family,—but that a phase of vital energy, occurring on any flower at a certain stage of its career, will produce a certain definite result. It is not a reversion towards any particular ancestor,—but a reversion towards the polyphyllous condition, the common type of all monopetalous flowers.

SKELETON LEAVES AND FRUITS.—To some extent any skeleton is natural, but nature sometimes prepares them in peculiar ways. Mr. E. Newlin Williams has this to say of *Arabis Canadensis*: "In the fall and winter woods we are apt to see the *Arabis* or sicklepod, with its abundance of slender, scythe-shaped valves and the flattest and lightest of chestnut-brown winged seeds. The first time I met it I took it for a bean or a pea instead of a mustard. In one specimen I found the valves had been whipped away by the winter, and there only remained an outline skeleton of two curving threads—a mere wraith of a pod! The mustard brings to mind the triangular capsule of the shepherd's purse and the round flat pods of the pungent wild pepper grass, so pleasant to bite at when green."

PROLIFEROUS ROSES.—Mrs. Wm. Hopkins, Jr., of Germantown, sends a rose flower, out of the centre of which a number of smaller flowers are growing. Roses show this freak occasionally, as do other flowers,—but the present season seems to exhibit more than usual. These freaks are now welcome to students in morphological botany. They teach that a rose flower is but an arrested branch. With a less display of resisting force a rose flower might have been a branching bunch of roses.

THE FLOWERS OF THE SUMACH.—I wish to ask you a few questions in regard to the sumach. We have several clumps on our place here, and one clump especially is planted in a very conspicuous place, and we very much desired to have the red "bobs" show in the latter part of the season; but every year they fail us. They bloom profusely, and the panicles of bloom are immense,—a foot or more in length, and large in proportion, but the blooms always drop off, leaving the bare main stalk which soon dries up and breaks off. In examining several clumps to-day that are growing wild, I find that every clump which has perfectly formed bobs on has the new growth and the main stem of the leaves covered with a short fuzz, while the variety with the large panicles of bloom and no bobs had the new growth perfectly smooth, the main stem of the leaf perfectly smooth and the upper side of the leaf stem red in color. There was also a marked difference in the leaf. The variety bearing the bobs having a leaf much more notched on the edge than the other, and shows the veins more plainly. I concluded that there were two varieties, one bearing bobs and the others not; but on coming to the group mentioned on our grounds, I find that it is the same variety that bore the bobs in another location. Can you explain the matter to me, or state why the blooms drop on some and remain on others? I also have a fine specimen of *Rhus laciniata* on the lawn, and the spike of bloom is dropping this year the same way. Last year it had a spike of red bobs. We cannot see any insects at work on them. It may be the birds, but we do not notice them working specially on them.

We have a specimen of *Oxydendron arboreum* in bloom at the present time. It is the first specimen of it I have ever seen in bloom. We also have a fine *Stuartia pentagyna* in bloom at present. We think a great deal of this, and intend making a clump of it.

Lakewood, Ohio. F. E. CARR.

Mr. Carr has done well in drawing attention to these sumachs, as there is much of popular interest about them. The smooth one is *Rhus glabra*, the "fuzzy" one is a different species, *Rhus typhina*, the Stag-horn Sumac. But aside from this, they have separate sexes on different plants. The one "in the conspicuous place" is evidently a male plant. The female plant always produces "bobs" or seed vessels; but unless pollen from the male plants reach them, they are hollow and seedless. In the experience of the writer, plants with perfect seeds and plants with the hollow seed vessels often grow side by side, and indeed have their branches occasionally interlace, and yet each preserves its fertile or infertile character. The explanation probably is that the fertile plant is not purely pistillate, but hermaphrodite. But although this has been in mind to examine at the blooming period, it has always been overlooked in due season. Certainly the female flowers get no benefit from the pollen of the male plants, either by the wind or by insects, although this point is much insisted on by speculative writers on the cross-fertilization of flowers. The male flowers are especial favorites with bees and many other insects. A bunch of male flowers is a perfect entomological cabinet, and well repays a lover of nature for watching it when covered by the insect world. Whether they visit the female flowers so freely has not been especially observed.

In garden scenery few things can vie in autumnal beauty with the various species of sumach. They are worthy of much more attention in landscape gardening than they generally receive.

CIRSIUM OR CNICUS DISCOLOR.—In addition to what has been stated of this beautiful thistle in the general chapter it may be noted that *Cnicus discolor* is perhaps one of the best representatives of the thistle family to be met with in the Atlantic United States. It is rare that we can make a good day's excursion without meeting with it. Along the lines of railroad to the Mississippi river, it strikes the traveler as being very common, and yet it wholly escaped the notice of the earlier botanical explorers. Muhlenberg, the famous botanist of Lancaster, Pa., first noted it and named it *Cnicus discolor* from the white undersurface of the green leaf. The plant was by him communicated to Willdenow who described it with Muhlenberg's name. Muhlenberg includes it in his catalogue of American plants issued in 1813, but confines it to Pennsylvania. In 1818 Nuttall gave a very good description of it in his "Genera of North American Plants," and then assigns it to New Jersey as well as Pennsylvania.

SEEDS THAT CLAIM HUMAN FRIENDSHIP.—Mr. E. Newlin Williams has the following charming thing to say of even such homely things as "beggar-ticks." He is writing of a wood in Eastern Pennsylvania: "Then the *Desmodiums*, whose leaves in our neighborhood are generally skeletonized, and whose pods in all habitats have the trait of sticking fast to one. I bring home rows of them every time I go to the woods, and my collie brings many more. Five species are easily recognized by the difference in the pods, though they have more distinct differences in their foliage and form. It is the *Desmodium paniculatum* of which Thoreau speaks, when he says, 'You may run as for your life, yet these pods will have time to stick to you as you pass.' We bring home several other things without the trouble of plucking them—two or three kinds of beggar-ticks, *Polygonum*, sweet cicely, *Geum*, and the urn-shaped capsules of the agrimony; but there is one, worst of all, and, studiously to be avoided, namely, the tick-seed, with which you have surely met. The stem pulls away from a string of the capsules and leaves them in a serried rank of apparently undetachable hedge-hogs, with their hooked bristles buried in the cloth. They come off by main force, and the green prickles that stay behind die and are lost to notice, though you are conscious that they will always form a part of the texture of your walking suit. In picking off the stickers I sometimes find things I never saw stick before, and so add them to my list of plants whose seeds are disseminated by attachment. No doubt if I should examine my dog I should find more, as he penetrates wilds which I despair of, fearless of smilax and wet and the marsh."

HOW NATURE PROTECTS SEEDS.—Mr. G. N. Williams says: "The nuts have learned by long experience how good they are, and have armed themselves with formidable husks to strengthen their chances for being left uneaten. The chestnut from the very beginning shows only the part we know as the trio of little bristles at the end of its tail. Then the beech nut has a tough hull to protect it through its growing days. But the rude exterior of both these nuts protects the downiest of nests for the seeds from babyhood to ripeness. The shellbark and walnut are wrapped in a close bitter hull until the inner well-nigh impenetrable shell is a well hardened protection. The squirrels must get through most of them of course, but they do not gnaw at more than are necessary, being economic in the matter of dentistry. The acorn does not seem so well protected, perhaps it is because it is the natural food of the rodents, while the richer walnuts and shellbarks are meant for rare luxuries, being so difficultly attainable. The squirrels, it would seem, would eat even chestnut burrs when hard pressed. I have seen the snow died brown with the nibbled hulls in a severe winter. Then, too, I have seen sparrows making a meal off the wild amaranth and goose-foot seeds, littering the snow with the chaffy hulls. The cross-bills feed on the seeds of the Hemlock cones just outside our window in winter and afford a pretty sight,—a flock of them taking all sorts of positions to get at the seed. The red squirrels like the green seed of the cones, for I often find the resinous scales scattered about under the tree."

EXTENSION OF PLANT LIFE.—Mr. W. C. Egan says: "Is not the George Peabody Golden Arbor Vitæ, or any other sport propagated by slips or cuttings so that in fact each one living is in reality part of the original sport; and in this way the original will exist in parts, much longer than the natural term of existence, had the plant not been propagated? I understand it to be so,—if wrong, set me right."

Yes,—the Red Dutch Currant, for instance, has been increased by cuttings for many hundreds of years, though the original plant which started this great improvement on the wild *Ribes rubrum*, could not have endured these many ages under the most favorable circumstances. After all, what is the plant, is but a single cell. Nearly all portions of a tree are practically dead portions after they get to be a year old, though we usually regard wood as dead only when it commences to decay. This decay will affect parts not so far advanced, and it is the increasing bulk of inert matter acting on the comparatively smaller aggregate of active life, that results in the final death of the tree. When we take a cutting from the weight of these depressing conditions, we give it new life. When the brakes are removed, the car of life moves smoothly on. It is the balance which decides the question.

UNION OAK.—The White Oak represented by the cut is growing on the farm owned by Miss Rhoda Hampton, on the Hampton Road north of the Marlton Turnpike, and about four miles from Camden. The larger body is 2 x 4½ feet in its diameter and the smaller 1½ x 2 feet. It appears to be sound and quite solid above the union. The earliest date the writer could learn of its being observed was about forty years ago, when it was said to be about as large as a man's body. There has been much discussion as to the cause of the singular growth. The inside of the parts are more nearly flat and the outsides more oval as indicating a split, but the trunks are too far apart at the ground. The smaller trunk is larger just below the union than farther down, as if a branch had been turned down and rooted; but the writer thinks that, as a fence formerly ran through the opening, two saplings had been drawn together and bound with a withe to serve as stakes to hold the rails in place. The marked rod gives the dimensions of the opening more correctly than the medium sized man who stood back out of the shade of the trunk. It is said that photographs, like figures, do not lie; but both tell big fish stories sometimes.

UNION OAK.

Camden, N. J. R. BINGHAM.

This is undoubtedly a case of natural inarching, the union having occurred at an early age. Very good reasons derived from a knowledge of the manner in which wood is formed, would be adduced against the idea of a split trunk,—as also against the suggestion of a branch turned down and rooting. No theory but natural inarching will suit the case.

AN ARRESTED BLACKBERRY BRANCH.—Mrs. S. M. Gaskill, Swarthmore, Pa., sends a branch of a common blackberry, which is terminated by a single blackberry fruit, looking like a miniature drum stick. Quite a large sized leaf is just under the berry. Botanists tell us that it takes a whole branch to be gradually modified into a fruit. In this case the fruit was suddenly formed without the branch going through its gradual transformation. It shows how growth energy will vary in intensity in the same plant.

TREES AND LIGHTNING.—Mr. C. D. Phipps, of Franklin, Pa., says: "I note in the July issue of the MONTHLY, the paragraph regarding lightning striking the highest objects. I do not think it will deviate a particle in its course for any object. I have in mind two cases, one of them being so near myself and horse that we were badly stunned. The fire,—if so I may call it,—came direct to the ground between large shade trees and a house in a space of not more than 15 feet. The other case was in which a small tree was struck, a large house with rod protectors being on one side and large trees on both sides. One of our neighbors was killed in the yard near the house. These may be exceptions, but they will carry out my idea."

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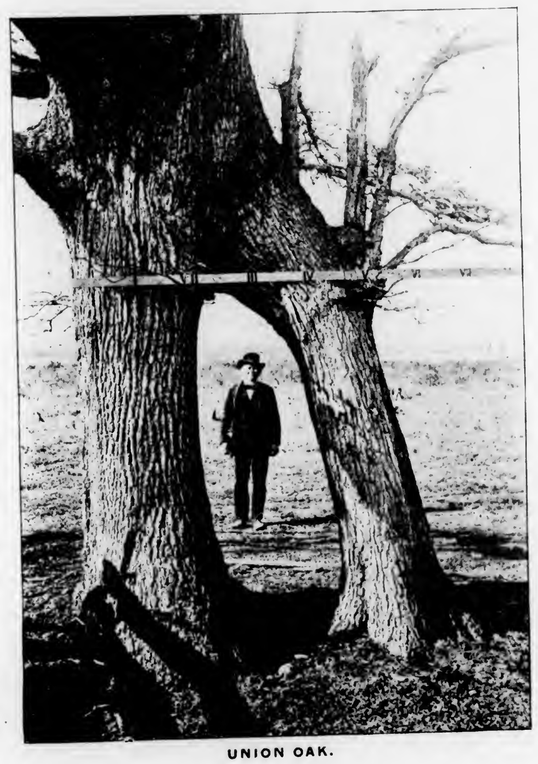
Yes,—the Red Dutch Currant, for instance, has been increased by cuttings for many hundreds of years, though the original plant which started this great improvement on the wild *Ribes rubrum*, could not have endured these many ages under the most favorable circumstances. After all, what is the plant, is but a single cell. Nearly all portions of a tree are practically dead portions after they get to be a year old, though we usually regard wood as dead only when it commences to decay. This decay will affect parts not so far advanced, and it is the increasing bulk of inert matter acting on the comparatively smaller aggregate of active life, that results in the final death of the tree. When we take a cutting from the weight of these depressing conditions, we give it new life. When the brakes are removed, the car of life moves smoothly on. It is the balance which decides the question.

UNION OAK.—The White Oak represented by the cut is growing on the farm owned by Miss Rhoda Hampton, on the Hampton Road north of the Marlton Turnpike, and about four miles from Camden. The larger body is 2 x 4½ feet in its diameter and the smaller 1½ x 2 feet. It appears to be sound and quite solid above the union. The earliest date the writer could learn of its being observed was about forty years ago, when it was said to be about as large as a man's body. There has been much discussion as to the cause of the singular growth. The inside of the parts are more nearly flat and the outsides more oval as indicating a split, but the trunks are too far apart at the ground. The smaller trunk is larger just below the union than farther down, as if a branch had been turned down and rooted; but the writer thinks that, as a fence formerly ran through the opening, two saplings had been drawn together and bound with a withe to serve as stakes to hold the rails in place. The marked rod gives the dimensions of the opening more correctly than the medium sized man who stood back out of the shade of the trunk. It is said that photographs, like figures, do not lie; but both tell big fish stories sometimes.



UNION OAK.

Camden, N. J. R. BINGHAM.

This is undoubtedly a case of natural inarching, the union having occurred at an early age. Very good reasons derived from a knowledge of the manner in which wood is formed, would be adduced against the idea of a split trunk,—as also against the suggestion of a branch turned down and rooting. No theory but natural inarching will suit the case.

AN ARRESTED BLACKBERRY BRANCH.—Mrs. S. M. Gaskill, Swarthmore, Pa., sends a branch of a common blackberry, which is terminated by a single blackberry fruit, looking like a miniature drum stick. Quite a large sized leaf is just under the berry. Botanists tell us that it takes a whole branch to be gradually modified into a fruit. In this case the fruit was suddenly formed without the branch going through its gradual transformation. It shows how growth energy will vary in intensity in the same plant.

TREES AND LIGHTNING.—Mr. C. D. Phipps, of Franklin, Pa., says: "I note in the July issue of the MONTHLY, the paragraph regarding lightning striking the highest objects. I do not think it will deviate a particle in its course for any object. I have in mind two cases, one of them being so near myself and horse that we were badly stunned. The fire,—if so I may call it,—came direct to the ground between large shade trees and a house in a space of not more than 15 feet. The other case was in which a small tree was struck, a large house with rod protectors being on one side and large trees on both sides. One of our neighbors was killed in the yard near the house. These may be exceptions, but they will carry out my idea."

INTENTIONAL SECOND EXPOSURE

ACCELERATED DEVELOPMENT.—It is well understood in these days that the various forms of plants result from internal growth force. This force is exhausted before it reaches far,—hence plants vary with the degree or the direction of energy involved. A species therefore can only vary to a limited degree, because the energy is worn out before it reaches far. There seems to be a normal degree or condition of growth in all species. When this is exceeded we say growth has been accelerated,—when it falls short, growth is said to be arrested. There are frequent illustrations of these cases in abnormal forms. In the rose it is not uncommon to note a small rose growing up from the center of the normal flower. Herewith is another illustration of acceleration in a head of white clover, gathered at Hackettstown, New Jersey, though sent from San Diego, California. The senior conductor has occasionally met with similar efforts in this clover. It shows how easily Nature might give us a racemose instead of a capitate head. It only requires that strong growth energy should be always in that direction.

WILD FLOWERS IN OKLAHOMA.—*Oxalis violacea L.* is so common as almost to assume a weedy character here in the spring. *Sabbatia angularis* of Pursh dots the prairies with its beautiful pink flowers. I have been noticing this summer how the anthers of this plant mature before the stigma. They at first stand erect while the twisted deeply two-lobed stigma lies bent over on a plane with the petals until the anthers have discharged their pollen and begun to coil outward. Then the stigma straightens up and untwists for pollination. A fine example of dichogamy.

A form of *Tradescantia Virginica L.* with pink flowers is quite common here. It does not answer the description of *T. rosea* of Ventenat, so I take it to be a form of the species *T. Virginica L.* which is very common.

Viola tricolor arvensis is so well established here, one would say that it is native.

Sapindus marginatus is frequent along the creeks here, and the so-called mistleto, *Phoradendron flavescens* Nutt., is often seen in tree tops.

Stillwater, Oklahoma. E. E. BOGUE.

VEGETABLE PHYSIOLOGY.—Mr. W. C. Egan puts the following interesting questions:—

"Is all, or what percentage is, stored in the roots during winter? If all, why do freshly cut oak posts sprout?

Are there two 'runs' of sap—the spring and mid-summer? Some people speak of the second run of sap. (Make a plain 'kindergarten' article.)

I've read considerable on horticultural matters, and endeavor to grasp many problems, but cannot recall any article on this question that left clear ideas in my mind. Whether *there is* a second run or not I do not know. I suspect something of the kind, as new growth appears in summer."

What is called the "rise of the sap" in spring is simply the separation of the layer of bark cells from the wood cells of the past year,—the period when the boys make whistle pipes. There is no "rise of the sap" in the popular sense of the word, but the plant's juices increase in abundance at the time when there is to be a heavy draft on the supply. The "second run" of the sap is the activity shown during the few weeks after mid-summer, when the new layer of wood is being formed.

Sprouts from freshly cut posts, or prostrate trunks, are fed by the food surplus, stored after the cells forming the annual layer of wood have been fully supplied. With no roots to furnish moisture and necessary food elements, the growth cannot be continued after the previous year's stores have been exhausted.

HOUSTONIA LONGIFOLIA.—Miss Margaret E. Houston, of Canonsburg, Pa., under date of May 8th, sends specimens of *Houstonia longifolia*, quite as pretty in its way as *Houstonia cærulea*, which under the common name of Quaker bonnets, Quaker ladies, Innocence, etc., has won its way deeply in popular affection.

GENERAL GARDENING.

A PÆAN TO THE PUMPKIN.

How dear to my heart
Is the old yellow pumpkin,
When orchards are barren
Of stuffin' for pies.
When peaches and apples
Have both been a failure,
And berries of no kind
Have greeted our eyes;
How fondly we turn
To the fruit of the cornfield;
Only fools these despise,
The old yellow pumpkin,
The mud-covered pumpkin,
The big-bellied pumpkin
That makes such good pies.

—*Louisville Democrat.*

PROPRIETARY RIGHTS IN A SEEDLING.—It has long been felt desirable that the same proprietary rights should be given to the discoverer of a new and valuable variety of fruit or flower that is given by the patent laws to the originator of a new mechanical device; but it has been found impracticable to give rights in any similar way by reason of the impossibility of the discoverer stating in language what special point it has that he claims as a proprietary right.

If one man can get a patent for something which could be described as the figure ten, and another could invent something which could be described as figure twelve, there could be no dispute as to which is ten and which is twelve; but the peculiarity which gives distinction to a fruit cannot be described in this way.

Something of the kind is, however, being disputed in one of the Minnesota courts. A Mr. Knudson has a seedling which he thinks valuable. A Mr. Heideman is selling something which Mr. Knudson claims is identical with his own; but the latter claims that he raised it himself. The only question to be settled by the court is whether it is possible for two different men to raise two seedlings which shall seem to be exactly alike.

The one who has instituted the suit, however, rather injures his claim by asserting that he raised his seedling by a cross between the plum and the cherry. It would seem that he should be made to prove this, as well as the party on the other side be made to show his plant was not a seedling. It seems far less probable that there should be a cross between a plum and a cherry; than that two different parties should raise what is practically the same variety.

WASTE WATER IN IRRIGATION.—The portions of our country under irrigation are having new experiences. As we know, when it rains a very small portion of the water is used by vegetation; the surplus goes into the earth to feed springs, or passes at once to add to the volume of rivers. So in localities where irrigation is practised, the larger portion of water used passes into other channels. A remarkable result, but one to be naturally expected is, that the underlying water level is often changed. Wells which at one time had the water level twenty-five or thirty feet from the surface, have it now ten or twenty. In other cases, springs of water will appear in ravines where never water appeared before. Many an owner with a dry and worthless piece of ground becomes suddenly wealthy by water appearing on his property in this peculiar way. But here the lawyer turns up,—and suits arise as to whose property the water is. Here in the East, or far West, we have to return a runaway horse when he is found on our premises,—and there the runaway water is as much of a question. Every condition in life has troubles of its own.

FIRS AND SPRUCES.—Some kinds of the pine family have cones that stand erect on the branches; and when they are mature, have the scales drop apart, leaving the central axis standing on the branch. Others have the cones pendent, and remain entire even when gathered from the tree. The latter are called spruces, and the former firs. Besides this the firs usually have the buds covered with turpentine,—while the bud of the spruces are usually scaly.

FAIRY RINGS. — What are known as fairy rings in meadows or lawns are not common in America; the fungus which produces them rarely showing itself in this country. The writer of this paragraph has not seen them very often. The only place where he noticed them in any great abundance was on the grounds of the late George W. Childs, near Philadelphia, and this was several years ago. They are produced by a fungus which is very good to eat, namely, *Marasmius Oreades*.

When the mushroom appears, it sends out a number of radiating threads which the gardener would call the spawn. This is of such a strong character as to destroy temporarily the grass, leaving a bare circular patch where the fungus has spread. The next year, however, the grass re-appears with renewed vigor, and it is much stronger and usually of a different color tint than the surrounding grass. The next year the mushroom comes from the circumference. It is said, though the fact has never come within the observation of the writer, that other rings extend subsequently, but that the part once occupied by the fungus will not permit of renewed growth of spawn in after years, and consequently there appears only an addition to the size of the circle. It is probable that new facts may be discovered in connection with these fairy rings by closer observation.

RAISING LARGE TREES.—In the vicinity of Philadelphia they have a fashion of lifting large trees where the grade has been raised that does not seem to be in practice elsewhere. Two ropes are attached to the top of the tree so that each can be drawn in different directions. A trench is dug around the base of the tree,—the circle being as wide as may seem judicious. When dug to the depth desired the earth is forked away from the ball, on one side, and a block set under the roots as a sort of fulcrum. The rope on that side is drawn over the block, and the result is the lifting up of the mass of roots on the opposite side. A little earth is then placed under these elevated roots, and the opposite rope drawn to that side. This lifts the roots over the block and more earth is placed there. The tree by the aid of the opposite ropes is then drawn backwards and forwards, more earth being placed at each turn. In a very short time the tree may be elevated as many feet as may be desired, standing on the summit of a firm mound of earth. Trees 25 to 50 feet high, with trunks 12 to 18 inches in thickness have been lifted in this way with very little check to future growth.

THE ROSE NIPHETOS.—Rose after rose is introduced; and rose after rose disappears in the course of a few years. Only a very few seem to survive in popular estimation for any great number of years. One beautiful Tea rose, Niphetos, is one of those rare survivals. Although it is some fifty years since it was first introduced, it is just as popular to-day in some quarters as ever it was. It may be that this is because it was one of the first of this class to have a fine oval shape, which is the form generally preferred by those who love cut flowers. This is certainly so in America. It made its appearance first in France in 1843, having been raised by a celebrated raiser of new roses, by the name of Bougere. The origin of the name is now attracting attention in the Old World. Some say it was given by Mr. Bougere, who was something of a classical scholar, after the nymph Nyphe, who was one of the companions of Diana; and that the name should therefore be spelled Nyphetos and not Niphetos. But like many other explanations of this kind it is probably nothing more than a shrewd guess.

EUCALYPTUS.—*Eucalyptus* is a honey tree. The different species of *Eucalyptus*, or blue gums, as they are commonly called, have had a great reputation in many lines of human usefulness; but it is something new to learn that in California they serve the same purpose, of being planted in order to furnish honey for bees, as the linden is employed in the Eastern States. They commence to flower in California in October, and some species follow with flowers during the whole season; for in California our winter season is their spring.

WINDOW GARDENING.—A very charming effect in window-box decoration can be made by planting dark red Geraniums with English Ivy in the foreground. Several residences along the Michigan Boulevard, Chicago, are so decorated,—the dark olive colored leaves of the ivy presenting a strong contrast with the scarlet flowers of the geranium.

SWEET PEA "RED RIDING HOOD."—Marked attention has been given toward the development of the Sweet Pea during the past two or three years, and many new and beautiful sorts have been produced. The Sunset Seed and Plant Company now announce a new sort which they will distribute next January, and which they have named the "Red Riding-Hood." They give the following description of it:—

"In this variety we have a fixed type, and an absolutely new departure in form. When fully developed, the standard and wings are a pleasing rosy pink, shading to blush white at the calyx; the keel, which is almost completely enveloped, being nearly pure white. Although unusually robust in habit, it is early flowering, and in plentitude and continuity of bloom it excels all other existing sorts. The standard is diminutive, and peculiarly convoluted, forming a hood around the wings, which protrude in wavy form, lending a novel and pleasing character to the flower. The fragrance surpasses, in a marked degree, that of other varieties of Sweet Peas. The length and rigidity of the stems are remarkable; they run eighteen inches long and over, and, when cut, the stem and bloom retain their stability for a much longer period than other sorts."

THE FALL OF A LEAF.—The fall of a leaf is a natural process characteristic of the higher type of vitality in a tree. A layer of cork cells is formed under this high vital power, and the leaf is detached. With a weakening of vital power the cork cells are not formed, and then the leaves are not thrown off, but remain attached to the tree. Any one may find lessons in this line from some forest trees, especially with different kinds of oak. Frequently it is the case that a large proportion of leaves will remain on the tree all winter, dry and brown, until the advancing growth in the spring throws them off; but they always will be found on the weaker trees, or weak or half-dead branchlets,—chiefly those in the centre of the tree where the absence of light or the absence of food leads to a weakening growth. It may also be seen where, during the summer season, a branch may be partially broken by the wind. Although that branch is not sufficiently broken to die entirely, its vital power is considerably checked, and the observer may note that the leaves on this branch remain dead and dry all the winter, while the leaves on all the rest of the tree may have fallen. A valuable lesson is therefore taught by this experience, that the fall of the leaf is a result of high vital energy. We may say that the perfectly healthy tree ought to shed its leaves easily when the proper period for the fall of the leaf arrives. If it does not shed its leaves easily, we may understand that we have a sickly tree.

THE ODOR OF THE AILANTUS.—Mr. C. L. Lochman, of Bethlehem, Pa., says that a seedling Ailantus recently flowered near that city and proved a female plant. It was absolutely odorless.

MINERAL MATTER IN PLANTS.—It has not yet been clearly demonstrated what particular purpose mineral matters serve in the woody structure of plants. A portion of lime, for instance, is found in some form or another, in almost all wood.

In cactus it is in combination with oxalic acid, or as the chemist would say in the form of oxalate of lime; and in cactus especially, crystals of oxalate of lime abound. Much attention has been given to describing the part these crystals play in the economy of plant life. Dr. Kraus, in Germany, has recently discovered that the crystals of oxalate of lime are more numerous at the end of the growing season, and that there is a steady loss of those crystals during the winter season. The question has been discussed in this magazine as to whether life is wholly extinct when the plants or animals seem frozen. When we are able to answer such questions as to what becomes of these crystals during the winter season when they are apparently consumed, we may find it has some bearing on the problem of life under low temperatures.

PROTECTION FROM EARLY FROST.—In districts in Japan where fruits and vegetables are liable to suffer from early spring frosts,—or, to speak meteorologically, late spring frosts,—they carefully preserve all the prunings of their trees and make heaps of them in various outlying portions of the orchards. When the frost likely to do injury is imminent, they start one of these brush fires in the direction from which the wind comes. They only make fire enough to make a smoke. To make a fire has a tendency to bring the cold into the orchard rather than to keep it out. Heat rarifies or lightens the atmosphere, and the cold or heavier air presses forward unto the vacuum made by the heat expanded. They depend on the smoke and not the heat for protection.

THE BLACK-MOLD FUNGUS.—In Florida, they have found that common pine tree resin is as effective in destroying the microscopic funguses as copper solutions; and especially in destroying the black mold, which is a species of microscopic fungus that sometimes seriously attacks orange leaves and orange fruit. These molds are known to the scientific as belonging to the genus *meliola*. The same or similar species of fungus is often found in greenhouses, on camellias and other plants with leathery leaves. The formula for the preparation of the spraying liquid is given as follows: resin, twenty pounds; caustic soda, four and a quarter pounds; of crude fish oil, three pints; water enough to make fifteen gallons. This is all boiled thoroughly until the resin is dissolved. It takes about ten minutes to boil thoroughly. A little more water is added while it is hot. After it has been thus prepared, while still hot, water enough is added to make it about one hundred and fifty gallons. It is said to be extensively used in the orange groves of Florida.

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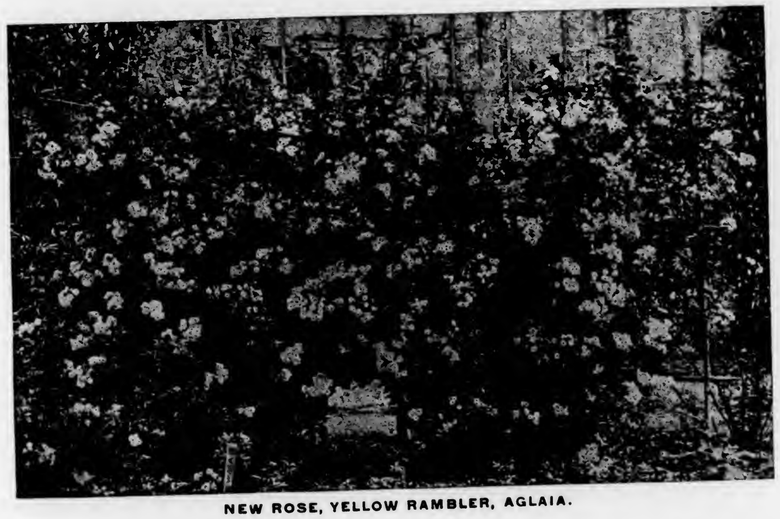
NEW OR RARE PLANTS.

NEW ROSE, "YELLOW RAMBLER," (AGLAIA).—The creating of new varieties of roses has continued unabated, and the coming fall and winter will see the introduction of several new sorts. One that will be particularly strongly recommended will be the "Yellow Rambler" or "Aglaia," and it will be introduced by Messrs. Jackson & Perkins, Newark, N. Y. This rose was raised by the well-known German rose-grower, Mr. Peter Lambert, who tested it for eight years before seeking its introduction, and then only after he felt convinced that it was a valuable acquisition.



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MAGNOLIA TRIPETALA VARIEGATA.—On the grounds of Senator J. D. Cameron, Harrisburg, Pa., stands a specimen of the golden-leaved form of the *Magnolia tripetala*. It is at least 35 feet high, and this year the golden color was unusually bright. Unfortunately the tree is standing with a number of other trees, consequently it is not a shapely specimen, though probably the largest tree known of this variety.

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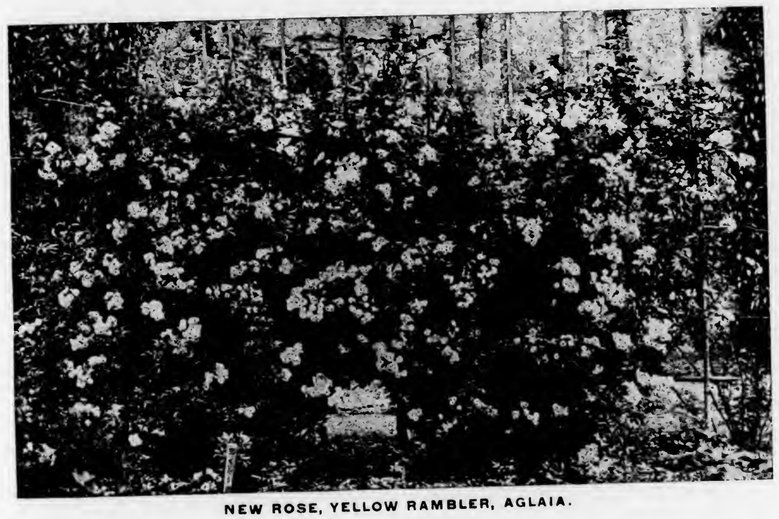

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INTENTIONAL SECOND EXPOSURE

CRIMSON RAMBLER ROSE.—Now that sufficient time has elapsed to thoroughly test the value of the Crimson Rambler Rose introduced two years ago by Ellwanger & Barry, it has been found that their original description and colored lithographs were not exaggerated in the least,—in fact it is doubtful if they gave it full justice.

A bed of fifteen Crimson Ramblers was planted on the ground of the New York Custodial Asylum at Newark, N. Y., in the eariy part of June, 1895,—they were then small plants from 2½-inch pots. When the writer saw the bed about the middle of June of the present year, the plants were fully seven feet in height, and though the flowers were past their best, the large trusses of deep crimson flowers produced a magnificent appearance. It is perfectly hardy and makes a strong and vigorous growth.

ASCLEPIAS TUBEROSA.—One of the most beautiful sights on a trip to the seashore recently was the showy clumps of this plant which is common in Southern New Jersey. Its masses of bright flowers, varying from a light orange-yellow to deep orange-red, seemed almost tropical in their gorgeous luxuriance. At one place the train stopped long enough for the passengers to gather some and I then noticed that many of the plants were evidently of the variety described by Pursh as *decumbens*. The branches are more reclining than in the type, and the umbels instead of being corymbed at the summits of the stalks, are often disposed, raceme-like, along one side of the drooping branches, and springing from the axils of the leaves. Nothing could be more strikingly beautiful than these graceful sprays of bloom, tapering off at the point of the spray to buds greenish with orange tips.

Dr. Darlington noted of this plant that it was "worthy of a place in the flower garden." I think any one can heartily second this endorsement who has taken the pains to observe it with the eye of love, and not simply as a "common milkweed."

Philadelphia. C. F. SAUNDERS.

This beautiful plant takes very well to garden culture. In the grounds of the conductors of this magazine, it has been among the most admired of the herbaceous plants that bloom about midsummer.

CLEMATIS MAD. EDW. ANDRÉ.—This variety was introduced here two years ago, and it is doubtless the best of its color. It is one of the Jackmanni type, and the color is a rich reddish plum, brighter than any of the so-called red varieties. The flowers are of good size and form, and it is altogether a very desirable sort.

THE HARDY FLOWER GARDEN.

THE BLACKBERRY LILY.—This beautiful and old-time resident of our gardens is one of those unlucky fellows that have to change their names. It was *Pardanthus Chinensis*. But even the conservative "Index Kewensis" regards its case of false pretense too strong. It gives it as *Belamcanda*. A contemporary, fond of reversing accepted names, calls it *B. Chinensis*,—but the last name will have to go too. It is now to be *B. punctata*.

RARITY OF SWEET SCENTED FLOWERS.—It has only recently been that the comparative scarcity of sweet-scented flowers has been pointedly noted,—and what is more remarkable in many large families of flowers there will generally be found one or two species worthy of being designated as "odorata" among many scores of odorless species. The genera *Viola*, *Begonia* and *Reseda*, in which are found the mignonette and violet, are familiar instances. But whoever heard of a sweet-scented phlox among the numerous species of that genus? But Miss Margaret Thompson, of Minneapolis, reports that *Phlox cæspitosa*, a spring flower of the Black Hills, is very fragrant.

ROCK GARDENS.—Few things give more pleasure than a rock garden when it is properly placed. Too often they are incongruous, and then fail to please. We all know what is meant by being in harmony with one's surroundings,—and can readily understand what is meant by being out of place, yet too often this is the condition of a rock garden. Tasteful gardening does not make new principles, but simply improves on nature. To find rocks where nature never meant there should be rocks strikes one unfavorably. A locality for a rock garden should be where one might expect to see rocks, should nature have been so disposed.

It is always worth while to have a rock garden if the conditions are favorable, as many plants thrive best in rocky places, and many do better there than elsewhere. With this is a representation of the Rock Garden in the Edinburgh Botanical Garden, for which we are indebted to the courtesy of the London *Gardeners' Chronicle*. It is admirably situated against a bluff, where one might reasonably expect to find rocks cropping out. The break between nature and art is made admirably to blend, by the introduction of the most artificial looking plants. To the left we see that Yuccas

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are largely employed, and on the right, in the centre of a little conical mound, we have the Monkey Puzzle, *Araucaria imbricata*, which one not accustomed to vegetation might be excused for doubting whether it belonged to the vegetable world at all.

But no rule for forming a rock garden can be given beyond the general statement that it should be made as far as practicable to work in with conditions already existing, or which one might reasonable suppose could exist in the situation chosen. They are always best on somewhat hilly ground.

FRUITS AND VEGETABLES.

EARLY CABBAGES.—The proof of the pudding is said to be in the eating. It is as true in regard to cabbages. In few vegetables is there so great a difference in the eating quality of the vegetable. Some kinds, in spite of the best art of the experienced cook, might make the Irish story of the mistake in cooking Paddy's leather breeches, seem a very reasonable one. In the line of a soft delicious flesh, which even toothless gums may masticate, the old Wakefield varieties have yet no compeer.

PEACH, TRIUMPH.—Messrs. D. Baird & Son, peach growers of Manalapan, New Jersey, send a picture of the new Triumph Peach, printed in all its natural colors, by the new colorotype process, by The Horace J. McFarland Company, of Harrisburg. It is beautifully done, and shows the wonderful advance of science in adding to pleasures of mankind. Few of us would have believed, even ten years ago, that the camera would ever give us the colors of nature. The peach itself is of a pleasing color, ripens with the Alexander, and is quite large for an extra early peach.

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INTENTIONAL SECOND EXPOSURE

THE SCAB DISEASE IN THE POTATO.—The potato tuber is often covered by a scabby skin, which seriously detracts from its market value. Mr. Samuel B. Green, the horticulturist of the agricultural department of the University of Minnesota at St. Anthony's Park, has contributed a valuable article which is published as "Bulletin 45," on the nature and care of this disease. The following abstract forms a complete epitome of the subject :

Scab of potatoes is caused by a fungus plant working in the surface of the potato. The germs of it are very abundant and live for many years in the soil and also over winter on the potatoes. If these germs are fed to stock they undoubtedly grow in the manure, and the use of such manure may often be a cause of infection. Also, they may be spread in the soil by the natural drainage and land receiving the drainage from infected fields may become infected even without ever having potatoes on them.

Scabby seed, when planted on new or old potato land, will generally produce a scabby crop, but the amount of the disease will generally be much more on the old than on new land.

Perfectly clean seed planted on land which is free from scab fungus will always and in any season produce a crop of smooth, clean potatoes, no matter what the character of the land. But seed potatoes apparently clean may have the germs of the scab fungus on their surface. This is often the case where they have been sorted out from a lot that is somewhat infected with the scab. In this latter case, the tubers should, at least, be thoroughly washed in running water, to remove any germs that may be present, or, what is better yet, be treated with corrosive sublimate (mercuric bichloride), as recommended.

Land infected by the germs of this disease will produce a more or less scabby crop, no matter how clean and smooth the seed used.

Scabby potatoes should be dug as soon as mature, since the scab fungus continues to grow on the potatoes as long as they are in the ground.

Scabby potatoes may be safely used for seed, provided they are first treated with corrosive sublimate as recommended. The cost of this treatment is a mere trifle, not exceeding one cent a gallon for the solution used.

Two ounces of powdered corrosive sublimate were dissolved in a wooden bucket, the liquid was poured into fourteen gallons of water contained in a barrel and thoroughly stirred. The potatoes were put in sacks and were thus soaked in the corrosive sublimate solution for one and one-half hours. They were then taken out, dried, and cut into pieces for planting. It was found that soaking them for two hours did not injure the growth in any way, but that one and one-half hours was sufficient time to kill the scab fungus where the tubers were only slightly affected. In one case where the tubers were excessively covered with the scabs, so that even the eyes could not be discerned, soaking for one and one-half hours was not long enough to kill the scab fungus. Where the potatoes are excessively rough, they should be soaked in the corrosive sublimate solution for at least two hours. But potatoes that are excessively scabby should, if possible, be avoided for planting purposes. The expense of the treatment above referred to for the prevention of scab should never exceed $1 per acre, including the cost of the material and the labor of treatment.

INFLUENCE OF THE STOCK ON SEEDLINGS.—A Chicago correspondent asks whether the stock has any influence in changing the character of seedlings of plants grafted on these stocks. So far as MEEHANS' MONTHLY knows, there have never been any recorded experiments on this subject. It is possible the stock might occasionally exert such an influence, but as a general rule, presumably it would not.

THE BEST PEACH LAND.—Careful comparison of results seem to point to the conclusion that peach orchards have proved the most successful on perfectly level land, and yet of such a character that water will not lie among the roots. To guard against this, in retentive soil the earth is ploughed up into elevated ridges, and the peach trees planted on these artificial banks.

MARKET CABBAGES.—It is said that one of the most productive industries of Florida is the growth of cabbages for Northern markets. They grow all fall and early winter, the climate at that season seeming especially agreeable to this vegetable.

NEW STRAWBERRY MCKINLEY.—Ellwanger & Barry, of Rochester, New York, have added to the already long list of varieties of Strawberries by the introduction of the McKinley, but it is claimed that it is such a superior sort as to entitle it to be classed among the best varieties. They furnish the following description of it :—

"It has been thoroughly tested on our grounds the last two years, and of the many kinds, new and old, we have growing, it seems superior to all, being conspicuous for its size, shape, color, and quality.

In size it is large ; shape roundish, inclining to conical, but sometimes flattened or cox-combed ; color crimson ; flesh moderately firm, and quality very good. The plant is vigorous, healthy, and a great yielder ; flowers bi-sexual or perfect.

We can confidently recommend it for garden and market culture."

CAULIFLOWERS.—There are few more delicious vegetables than a well grown cauliflower, but unfortunately it wants to go off to the mountains with fashionable society when hot weather arrives. If its desires are not gratified, it speedily runs to seed. In most parts of the United States therefore, it is a rather scarce vegetable. In the more northern portion however, very good results may be had by sowing under glass about the time tomatoes are sown. Young plants set out early in very rich earth, will generally do fairly well especially if very early varieties are selected. In the warmer regions they can only be had by sowing in September, and then growing the plants under frames. The heads then come in for use by early spring. It is possible that in some southern localities good cauliflower could be had wholly out doors in winter time, if so MEEHANS' MONTHLY would be glad to know.

HISTORY OF THE TOMATO.—In a lecture before the Massachusetts Horticultural Society, Prof. W. N. Munson, gave the following brief resumé of the history of the tomato :

"*Lycopersicum esculentum*, from which most of our common varieties of tomatoes have been developed, is a native of Peru, but is spontaneous or indigenous as far north as Texas and California, in a form closely approaching the Cherry Tomato of the gardens. The tomato was first cultivated in the south of Europe and is mentioned as early as 1561. The fruit was used for food in 1583, but was slow in coming into general use. Seven varieties were known at the beginning of the eighteenth century, but not till a hundred years later did the culture become general in England. The tomato was known and used as an article of food in this country in 1806, but was not grown for market until about 1829. The modern large fruited and irregular varieties, including the French Upright, and the *Grandifolium* or Mikado type, have undoubtedly been developed from the Cherry Tomato or a closely related form ; this development has apparently come about largely by the augmentation of cells in the primitive type."

APPLE, YORK IMPERIAL.—The York Imperial is an apple originating in southern Pennsylvania, and which has been brought to notice chiefly through the good work of the Pennsylvania State Horticultural Association. It grows in favor annually, and bids fair to attain a position among the standard varieties. It seems to do well almost everywhere, which is a good character in an apple, too many having local likes and dislikes.

RADISHES IN WINTER.—Radishes, fresh from the ground, furnish a welcome luxury to the amateur's table. Frost will not hurt them, but they do not grow when the temperature is below the freezing point. But if only ten or twelve degrees above the freezing point can be maintained under a glass frame, seed sown in September will give drawings soon after Christmas, and which will continue till spring.

PULLING ONIONS ON THE GREEN SIDE.—A New York correspondent asks what Mr. T. A. Bedford, at page 157, means by pulling onions on the green side? The conductors have to confess their ignorance of this term. It is probably a local expression, only understood in onion growing districts.

TURNIPS IN AUTUMN.—Turnips detest hot weather. In the cool of the autumn they have an enjoyable time. If sown about the end of August or beginning of September the roots swell up finely before frost. They can be sown on ground which has just yielded potatoes.

BIOGRAPHY AND LITERATURE.

THE DECLINE OF LIFE.

The day becomes more solemn and serene
When noon is past; there is a harmony
In autumn and a luster in its sky
Which through the summer is not heard or seen,
As if it could not be, as if it had not been.

EVOLUTION IN THE VEGETABLE KINGDOM.—Two able papers on the present position of floral biology have recently appeared, one in England, by Dr. John C. Willis, of the University of Glasgow, and one in our own country, by Dr. I. A. Keller, of the Philadelphia Academy of United Sciences, contending that the adaptative idea in connection with the relation between flowers and insects has been pushed to extremes. This has long been evident to thoughtful biologists, and American science should have the the main credit for the reaction. Dr. Willis contends that the fact that the subject is so admirably suited for popular treatment is probably responsible for much of this exaggeration. Mr. Willis quotes Darwin—"that no organic being fertilizes itself for a perpetuity of generations, but that a cross with another individual is occasionally, perhaps at very long intervals, indispensable"—and shows that one studying orchids alone might arrive at such a conclusion. He then shows that this extreme had to be modified by Muller, that cross-fertilization was only of value in producing a stronger offspring, better able to serve in the "struggle for life." Mr. Willis now shows that whatever gain the progeny of cross-fertilization may receive, is too often more than counterbalanced by "the price the plant pays for it." In regard to the forms of flowers, he contends, as American observers have done before him, that various phases of the power to profit by nutrition is a leading factor in the origin of form. In regard to the use of color in attracting insects, he shows that a very large number of flowers with bright corollas have little or no nectar; and that flowers not visited by insects for nectar, and often those styled anemophilous, are often brilliantly colored. Dr. Keller's paper is another remarkable instance of two investigators, working independently, simultaneously reaching identical conclusions. "Perhaps," says the Doctor, "there is no more fruitful source of error in the experience of all scientific knowledge than a sudden, brilliant discovery which is founded upon careful observations in a limited number of cases, and the wholesale application of its results without the exercise of sufficient caution." Dr. Keller shows that dimorphism, or the relative maturity of stamens and pistils, is a result of climatic conditions, and this would make a flower "adapted" to cross-fertilization to-day, or self-fertilization to-morrow, so to speak; or, as it is put in the paper, in one country at one time, and in other countries at others. The immense prolificacy and strength of the progeny from cleistogamic flowers is particularly dwelt upon, and the conclusion reached that where flowers are dependent on insect aid for fertilization, they are the worst fitted to engage in the "struggle for life."

ROBERT SCOTT.—Mr. Robert Scott, a well known and esteemed florist of Philadelphia, died on July 23d in his 78th year. Born in Scotland, he was employed in Wright & Perry's—now Veitch's—nursery at Chelsea, near London, which firm recommended him to the late Richard Buist as foreman in charge of his large greenhouse department in Philadelphia—then, 1844, the finest in America. On the selling out of the ground for building purposes Mr. Scott established himself as a florist, which business, in connection with his sons, he continued to his death. He was especially interested in rose culture.

POTATO CULTURE IN JERSEY.—We can learn a great deal from the Old World,—both learn what to avoid as unsuited to us, and what to adopt to improve our own ways. An unpretending little pocket work, under the title of "Potato Culture in Jersey Island," by Rev. Chas. D. Merrill, of Beloit, Wis., is very valuable, for all the selling price is but a trifle.

THE SAGO PALM.—You speak of *Cycas revoluta* as the common Sago Palm. To begin with, it is not a palm at all, but belongs to the natural order *Cycadaceæ*, described as a natural order of small, palm-like trees or shrubs, etc.

It is said, in Henderson's Hand-book of Plants, speaking of this genus of plants: "They are commonly but erroneously called Sago Palms, as they furnish none of the sago of commerce. It seems, however, that they require the same cultivation in our houses as the palm tribe."

From the pith of their trunks is obtained an article of food like sago, upon which the natives of China and Japan live wholly for several months in the year. In fact, the name *Cycas* is the Greek name of a palm said to grow in Ethiopia. False sago is supplied by *Cycas circinalis*, in the Moluccas, and caffre bread by another species of the order above mentioned. There are several plants or trees, so-called palms, not belonging to the natural order *Palmaceæ*.

The sago of commerce is obtained from plants or trees belonging to the natural order *Palmaceæ*. One of the genus of palms from which the sago of commerce is obtained is *Sagus laevis*. C. A. PITKIN, JR.

Hartford, Conn.

Mr. Pitkin is right from a botanical standpoint,—but popular names defy botanical rules. Thus the Tulip Poplar is not a poplar, the Black Alder is a Holly; the Japan Ivy is of the grape vine and not ivy family; while there is nothing of the rose about the Rose of Sharon or the Rose of Jericho. The plant in question has been known so long as Sago Palm that we fear it will be Sago Palm to the end of time, for all that it is no palm at all.

THE MANNA OF THE HEBREWS.—Referring to your notes, page 120, concerning Manna, internal evidence given out of the sacred text that its keeping qualities were not impaired at the rising of the sun on the seventh day, as when gathered other days of the week, makes it conclusively miraculous food, since no explanation of such behavior of a plant product is at all possible. WM. BOMBERGER.

Harlan, Iowa.

The point is well taken. MEEHANS' MONTHLY has become interested in the question through a correspondent calling attention to an article in the *Christian at Work* endeavoring to show that Manna of the Hebrews was the exudation of a certain plant, and not a miraculous production except perchance in quantity and timeliness.

The question as to what plant could have thus produced it, brought the matter fairly before the magazine. It seemed surprising that a paper of the class to which the *Christian at Work* belongs should regard the miraculous character of the food as recorded, as needing natural laws to explain the miracle away. It might seem no less a miracle that the Manna should be an absolutely new creation, formed out of nothing especially for the occasion, as to be produced in miraculous abundance. But that is a matter wholly out of the province of this magazine. All that is for us to say is that there is no plant growing on that desert now, nor in the past, from which the food as represented could be produced in any way by the agency of natural law.

THE SOUTHERN FLORIST AND GARDENER.—This magazine, published at Louisville, Kentucky, is occupying an intelligent and useful field in American garden literature. It has increased to its strength by adding to its staff of Editors Mr. John Duncan. He is a graduate of Kew, and has been a prominent contributor to the London *Gardeners' Chronicle*. His knowledge of herbaceous plants is pre-eminent. He came to America in 1870, and has been since Professor of Botany and Horticulture in the University of Kentucky. The *Southern Florist* is to be congratulated on this new addition to its already good staff.

FLORILEGIUM HARLAAMENSE.—Under this title the Algemeene Vereeniging Voor Bloembollenculture, of Haarlem, Holland, have started a publication in folio form, with beautiful colored illustrations of their most popular bulbs. The history and descriptions of each variety are given in four languages,—Hollandish, German, French and English. March is the first number.

THE GREAT HAMBURG EXHIBITION.—Mr. Theo. Eckert, referring to our notice of this great exhibition, writes that all steamers entering the harbor, take goods free. It will not close till October 1897.

GENERAL NOTES.

STATE AND NATIONAL FLOWERS.—When a flower is connected with some great event, it is easy to have a State or national emblem. Like poets they are born and not made. Without the event there is no meaning to them. Utah is fortunate in the selection of the "Sego," the Indian name for the beautiful *Calochortus*, the plant whose roots aided in saving from starvation the little band that founded Salt Lake City. What manna was to the ancient Hebrews in their journey over the desert, Sego was to the followers of Brigham Young over the great desert of our country. In their recent carnival, the State flower had an important place. Following in the line of the Mardigras festival of New Orleans, the Salt Lakians arranged a Fourth of July carnival, taking only a national thought instead of a denominational one for the underlying sentiment. A queen or goddess of liberty, supposed to be eminent for beauty and attractiveness, was selected to rule the city, who was to deliver over the reigns of government on the Fourth of July, after the Declaration of Independence was read. Mrs. H. Y. Jennings, a grand-daughter of Brigham Young, was elected to the throne, having the necessary qualifications. In like manner a lady, similarly qualified, formed a part of the representation of Utah's State flower. This fact is thus reported in the *Tribune* of that city :

"The Ogden band headed the division which contained the float "The Sego Lily," the State national flower. Miss Vilate Peart sitting in the petals. Miss Peart makes a splendid representation of the State blossom, and like the beautiful creation she represents, is fair beyond compare. Utah is as proud of her as it is of the sego."

THE LAW IN PLANT VARIATION.—There has been a curious law suit in the Old World regarding a variety of orchid that originated as a sport. Some plants occasionally send out a branch different from all the others. If this departure be cut off and grafted, or rooted, it usually retains its distinctive characters. Many fine roses, carnations, dahlias and chrysanthemums have originated in this way. An orchid, a *Cypripedium*, sported. This class of variations is termed sport. A collector of rare orchids saw the beauty, and bought it for a fabulous sum. The next year it returned to its original form, and the suit was to get his money returned to him. The court decided that as he knew it was a sport he ran his own risk. He lost the case.

GROWTH OF TREES.—Some beech trees in one of the parks at Plymouth, Massachusetts, have been measured for six years in order to ascertain their average increase in diameter per year. The greatest growth was found to be ½ inch ; but the average growth of twenty trees in five years was found to be ¼ inch,—that is to say the ring of wood formed was ⅛ of an inch thick.

By getting a good idea of the average growth per year, one may very nearly arrive at the age of a tree without cutting it across to count the rings.

PUBLIC GARDENS AND PARKS.—It begins to be a matter for wonder how any large town or city can get along without its public garden or park. The pent up denizens crowd them whenever possible. The recent report of the Missouri Botanical Garden shows that on a single Sunday, last September, 30,151 visitors were counted as entering the gates. Not a single act of vandalism was committed by this vast crowd.

SMALL PARKS IN NEW YORK.—New York city has 7½ per cent. of its area in park ground,—but below 44th street, where half New York's population lives, the area is but 2½ per cent. The great want of modern civilization in cities, is small parks for people who never see the larger ones. In Philadelphia thousands of dollars are being spent in buying parks where miserable buildings stood.

SITUATIONS WANTED.

Advertisements under this head, not exceeding 50 words, will be inserted once for 50 cents, or three times for $1.25.

GARDENERS:—We shall be glad to furnish names of competent gardeners adapted to large or small places. Gardeners wishing situations should correspond with us. THOMAS MEEHAN & SONS, Nurserymen, Germantown, Philadelphia.

GARDENER—Situation wanted by a man thoroughly experienced in all branches. Age 38, married, 2 small children. Excellent references. Address, J. W. B., care of MEEHANS' MONTHLY

GARDENER—English, aged 38, married, small family; 24 years experience in growing orchids, ferns, stove and greenhouse plants, roses, carnations, chrysanthemums ; also the management of fruit houses, vegetable and flower gardens, etc. State wages. Chas. Dumper, 119 Tallmadge St., Poughkeepsie, N. Y.

AS GARDENER, by a man of experience and ability, will be disengaged 1st of March next, thoroughly conversant with the management of a gentleman's country estate, unexceptional references for ability and personal character.
Address, J. E. S.
Box 103
Toms River, N. J.

HEAD GARDENER—*Estate Manager*—Situation wanted by a theoretical and practical gardener, 27 years experience in Landscape work, cultures under glass or out-doors, all branches of gardening. Best references from *first-class* places. Europe and U. S. February or later, "R. F.," Office, Meehans' Monthly.

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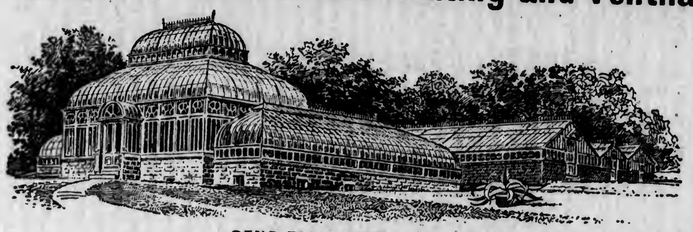

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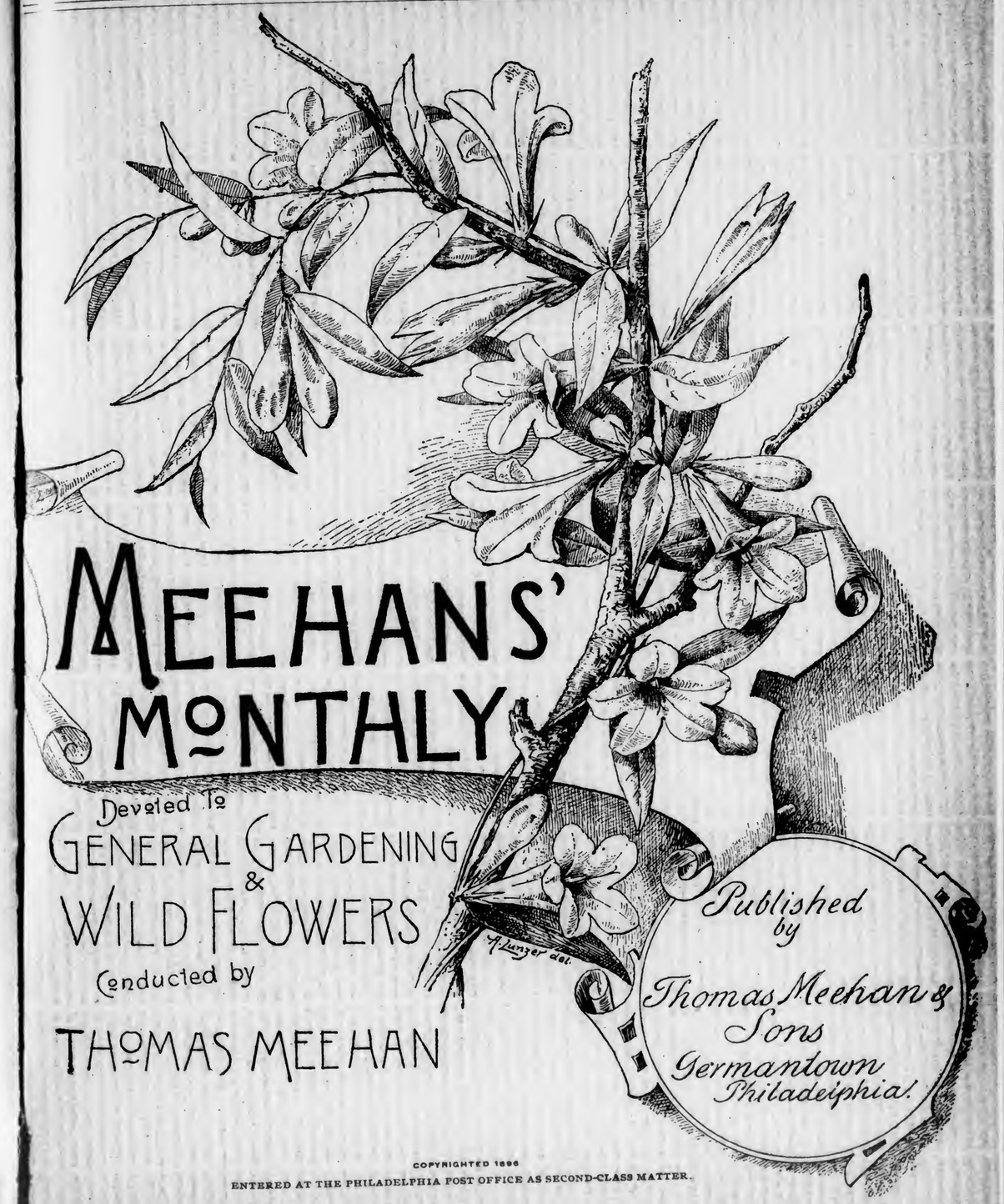

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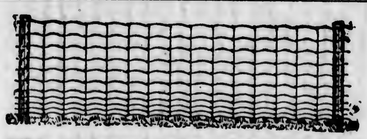

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LESPEDEZA HIRTA, Elliott.—Stem villous; leaflets roundish-oval, pubescent beneath; raceme capitate, axillary, oblong, longer than the leaves; corolla and loment about as long as the calyx. (Wood's *Class-Book of Botany*. See also Gray's *Manual of the Botany of the Northern United States*, and Chapman's *Flora of the Southern United States*.)

Lespedeza hirta was one of the first to attract the attention of the earlier botanists to whom it appeared as one of the clover family, and is described by Gronovius in his Flora of Virginia as "*Trifolium fruticosum hirsutum*,"—and we see here the origin of its common name of Fruticose or Bush Clover. It was said by Clayton, who furnished the notes and specimens for Gronovius, to have "the flowers disposed in a long, hairy spike." In Linnæus' time it came to be classed with *Hedysarum*, and in the *Species Plantarum* of this author it is described as *Hedysarum hirtum*. Botanists are often exercised to find some distinctive character by which large genera are divided. In this case many of the family had the loment or seed pod divided like a chain, with one seed in a section of the chain-like pod. Others had a pod with only a single seed, and no chain-like division. Michaux, in 1803, proposed to separate the last from the first under the name *Lespedeza*, and this has been accepted by succeeding botanists. He could, however, find only three species on which to est[illegible] the genus, leaving nine remaining under *Hedysarum*.

Michaux tells us he named the [illegible] in honor of Governor D. Lesp[illegible] charge of what at that time wa[illegible]anish territory of Louisiana, and who rendered him good service in his travels through the territory; but his journal shows no obligation to any Governor of Louisiana—but much to the Governor of Florida. He started down the Mississippi to explore, but returned after reaching the mouth of the Cumberland. This seems all that is known of Lespedez.

Michaux, when making the genus *Lespedeza*, named our plant *L. polystachya*,—and Persoon, in 1807, named what proved to be the same plant, *L. villosa*. Why botanists have adopted the name of Elliott, *L. hirta*, not given to the plant as a *Lespedeza* till 1824, does not appear, considering that the botanical canon is that the prior name ought to prevail. Some have contended that the adjective should be carried through though the nominative might continually change, but this is not conceded by others. In this case the plant might be named *Lespedeza hirta* of Linnæus, but who did not regard it as a *Lespedeza* at all. The matter is of little consequence in itself, but furnishes a lesson to the student in regard to the difficulties surrounding a stable nomenclature in plants.

A remarkable feature in some plants is that they have the power of producing two distinct forms of flowers, on the same individual, though often at different stages, of the plant's growth. One class of flowers is as we usually see and understand a flower to be; that, is with the petals, often bright colored, that we usually understand as the most essential part in the idea of a flower,—the other class has no petals, and indeed the calyx rarely opens or appears more than a mere bud. But inside, the pistil is absolutely perfect, and a stamen or two may bear a little pollen,—but even with but a few pollen grains the bud is fertile and produces a seed vessel. This latter class of flowers are called cleistogene. As a general rule, when these two classes of flowers exist on the same plant, the sho[illegible]etal-bearing flowers are more or less infe[illegible]e,—but the imperfect bud-like blossoms bear seeds freely. The reason for this curious arrangement in the economy of nature has been a matter for numerous speculations, none of which, however, have commended themselves to general acceptation. In *Lespedeza* some species bear cleistogene flowers, and the genus is divided into two sections in accordance with this fact. *Lespedeza hirta* belongs to the section which has perfect flowers always.

COLOR PHOTO
MUTILATED

LESPEDEZA HIRTA.

HAIRY BUSH-CLOVER.

NATURAL ORDER, LEGUMINOSÆ.

LESPEDEZA HIRTA, Elliott.—Stem villous; leaflets roundish-oval, pubescent beneath; raceme capitate, axillary, oblong, longer than the leaves; corolla and loment about as long as the calyx. (Wood's *Class Book of Botany*. See also Gray's *Manual of the Botany of the Northern United States*, and Chapman's *Flora of the Southern United States*.)

Lespedeza hirta was one of the first to attract the attention of the earlier botanists to whom it appeared as one of the clover family, and is described by Gronovius in his Flora of Virginia as "*Trifolium fruticosum hirsutum*,"—and we see here the origin of its common name of Fruticose or Bush Clover. It was said by Clayton, who furnished the notes and specimens for Gronovius, to have "the flowers disposed in a long, hairy spike." In Linnæus' time it came to be classed with *Hedysarum*, and in the *Species Plantarum* of this author it is described as *Hedysarum hirtum*. Botanists are often exercised to find some distinctive character by which large genera are divided. In this case many of the family had the loment or seed pod divided like a chain, with one seed in a section of the chain-like pod. Others had a pod with only a single seed, and no chain-like division. Michaux, in 1803, proposed to separate the last from the first under the name *Lespedeza*, and this has been accepted by succeeding botanists. He could, however, find only three species on which to es[illegible] the genus, leaving nine remaining under *Hedysarum*.

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COLOR PHOTO
INTENTIONAL SECOND EXPOSURE

The philosopher, looking for compensation in nature, might say that the flowers being comparatively insignificant and without the gaudy character possessed by other species, might be regarded as almost within the cleistogamous class at any rate,—and this sentimental conclusion might be sustained by the fact that every flower is as abundantly fertile as if really cleistogene. It is, however, but the small size of the flower which gives the impression of homeliness. Under a magnifying glass, the beauty is found to be equal if not superior to the more showy kinds. But though not attractive so far as colored petals are concerned, it combines in its whole appearance many striking elements of beauty. The artist has taken advantage of this in the make-up of the picture here presented, for the whole picture is beautiful. Many a fern that might call for admiration would have no more points of excellence than this picture affords. After all, it may be a question whether we do not place too much stress or color as an element of beauty. No one expects color in a fern, yet the exclamation of "how lovely" is often heard when meeting in the wild woods some fern-clothed bank, or the abundant growth of ferns in the fissures of some rugged pile of rocks. And many a tree, which we should scarcely know had flowers at all, but for the fact of its having nuts, acorns, or berries of some kind, is regarded as absolutely beautiful by the beholder. Our hairy bush-clover, though requiring a lens to show us its really pretty colors, often presents itself to us in a manner to command admiration. One such instance is especially remembered by the author. It was a burning hot day in August. Everything was parched and brown. The locality, in Eastern Pennsylvania, was a somewhat barren one. Small washed pebbles and fine sand constituted the chief portion of the soil, and the heat, waves trembling as rising from the ground, were suggestive of some firey furnace, rather than of a place where lovely wild flowers should dwell. But over the surface, scattered here and there, were large groups of our friend, in company with its sister plant, *Lespedeza capitata*, with not a leaf wilting under the burning sun. Whenever Americans shall undertake a language for our wild flowers as Europeans have done for theirs, courage may be noted here.

Lespedeza hirta has made no mark for itself in the arts, nor found to serve any purpose in the economy of human life.—but it is one of those which in modern times has been telling us something of the wonderful history of the past. In our country this and other Lespedezas are not found to any great extent beyond the lines of the Mississippi and Missouri. Of the nine or ten American species, not one is found to have reached the Rocky Mountain region,—nor is there any on the Pacific Coast. But *Lespedeza hirta*, our present species, appears again in Japan, and is found to have precisely the same tastes there as here,—being found on rocky hill sides among shrubby plants, or in half-shaded, open places in the woods. There is no ground for believing that identical plants had separate originations. A few species may have been carried by seed to new locations long distances apart, just as we find plants of the Old World brought to the New by the agency of man. But the appearance of American plants in Japan could not be explained in this way. The groups of this *Lespedeza* must have had a close connection in the past. The conclusion is inevitable that there must have been at one time in the Earth's history, a land connection between the Eastern Atlantic States and Japan,—that there must have been a subsidence from the line of the Mississippi to Japan, and a subsequent upheaval of those parts in which the *Lespedeza* does not appear. Japan and the Eastern Atlantic States can thus be proved by this pretty little plant to be rather very old than very new parts of the earth's surface. The Pacific coast is the new world. The points narrated show how closely related the facts of Botany are with many other studies of universal interest.

This species extends far northwardly being found rather commonly in Northern Canada —and it may be met with in every state as far westwardly as Minnesota, and southwardly to Mississippi and Florida. It is especially common in Ohio.

Early in the century the botanist Pickering collected a form at Quaker Bridge, New Jersey, with virgate stems, growing four feet high, and with leaves one and a half inches long by one inch wide, and which may be a distinct species. It is possibly Britton's var. *oblongifolia*.

EXPLANATION OF THE PLATE.—The upper portions of two flower stalks, from a New Jersey plant.

WILD FLOWERS AND NATURE.

THE SILENT AUTUMN WOODS.

"'Twas autumn in the woods of Aldornere,
The chestnut-burs were bursting in the sun,
With their rich wealth of fruitage ripe and brown
That crackled down all day from bough to bough,
Where gathered restless troops of noisy crows
On the warm southern slopes that else were still.
The squirrel there was busy all day long
Hoarding his store deep in the hollow bole,
Down in the silence of those autumn woods."

—HOWARD WORCESTER GILBERT.

AMONG THE FLOWERS AT TRENTON FALLS — The neighborhood of Trenton Falls, in Oneida County, N. Y., has long been known to the summer tourist as a spot of rare natural beauty and grandeur. Here the west branch of Canada Creek, in a series of cascades and rapids, makes a descent of about 400 feet in a distance of two miles—cutting its way between perpendicular walls of Trenton limestone, which tower above the dark waters of the rapid stream sometimes to the height of nearly 200 feet. Such is the formation of the rock, its surface split not only horizontally but often vertically too, and worn into many different shapes by the action of water, that in looking up at the solid piles of natural masonry one is reminded of the bastions of some mighty fortress set down here for some huger race than ours—some warlike Anakim of this western world. To the geologist, the region must be of peculiar interest; but the lover of plant life also will find much here to engage his attention. Indeed, the writer recollects the commendation of a well known naturalist of Philadelphia, recently deceased, who said of Trenton Falls that, for an intelligent outing, he regarded it as one of the best places to be found anywhere.

It was with that statement in mind that I stopped there about the middle of last summer to spend a part of two days. So short a time was of course inadequate to do anything like justice to the locality, but perhaps some notes of a few plants which especially appealed to one rather unfamiliar with northern woods, may not be without interest to some readers.

The sides and summits of the deep ravine through which the stream flows are covered with a primeval forest growth, in whose cool, dark shades, (kept perpetually damp by the moisture arising from the turbulent waters which fall and eddy and fall again far below,) the wild flowers have bloomed and fruited year in and year out for ages, with few doubtless to notice them. So steep are the sides of the gorge in places, so thick the growth of shrubs, and so unstable the loose, light soil, that progress is extremely difficult, and to be prosecuted only with the help of the hands. In the chinks of the shaded cliffs, some specimens of the beautiful fern, *Pellæa gracilis*, were found. This is peculiarly a northerner, never having been reported, I believe, south of Pennsylvania. Here, as at Chittenango Falls where I had collected it a few days before, its fronds were almost, if not quite, prostrate—certainly a lazy sort of habit for a plant so gracefully outlined as this. Near by were some trim specimens of the ginseng, or "ginshang" as the herb gatherers call it, (*Aralia quinquefolia*), some in flower and some in fruit. The commercial value of the roots of this plant is considerable, so that "ginshangin," as the pursuit of it is termed, has been at times a rather remunerative vocation in the mountains, though growing more and more precarious every year, as the abstraction of the roots must mean absolute annihilation to the plants, which are nearly everywhere becoming scarce and scarcer.

The Beaked Hazel (*Corylus rostrata*) grows here, too, a shrub bearing nuts each of which is surrounded by an envelope of united bracts prolonged into a curious tubular beak, an inch and a half or so in length. It was also a pleasure to find here the Mountain Maple (*Acer spicatum*), although this is not an uncommon shrub, being found even as far south as North Carolina. The spike-like racemes droop gracefully when in fruit, and are very attractive, the small samaras being beautifully tinted that morning with pink and yellow.

As is well known, many characteristic lowland plants are at times found growing at great elevations, so it was interesting to find high up on this hillside under evergreens a plant whose habitat is given as bogs by Gray—namely, the three-leaved gold thread (*Coptis trifolia*). It is a cheerful little thing, with shiny, evergreen leaves divided into wedge-shaped leaflets. It forms quite a carpet over the ground in favorable situations, spreading by means of the long, wiry roots which easily distinguish the plant, being bright yellow in color and bitter to the taste. It was past flowering now, but in abundant fruit, each upright flower-stalk bearing a few sharp pointed, brown, membranaceous pods.

Walking on under the evergreens, I came soon to a spot where the ground was apparently strewn with green hemlock boughs. At first I thought this had been the work of woodcutters, but as I stumbled over the sprawling branches I found to my surprise that they were firmly rooted. The supposed boughs were in fact small evergreen shrubs of a straggling habit; and a little further investigation revealed the fact that they bore occasional, curious, fleshy, cup-shaped bodies that seemed at first glance as if they might be a sort of gall or similar excrescence. They were bright red in color and about the size of a marrow-fat pea, but with a hole in the middle, at the bottom of which rested a black, bony seed. They were, therefore, seedvessels, and upon reference to Gray's Manual, the plant was found to be the American Yew, or ground hemlock, (*Taxus Canadensis*,) classed because of its naked seeds among the cone-bearing gymnospermæ. The wood is tough, and it is said to have been used by the Indians for bows.

Another interesting denizen of these damp woods was the twisted-stalk (*Streptopus roseus*)—a member of the lily tribe, not unlike the Solomon's Seal in general appearance, and in summer bearing bright red berries suspended by slender axillary flower-stalks curiously crooked in the middle, as though broken—whence, doubtless, the name. Here, too, the Wood Sorrel (*Oxalis Acetosella*) displayed its lovely white blossoms veined with pink, and barely rising above the masses of clover-like leaves. This plant seems most at home in the dark recesses of cool, mountain woods, often creeping over mossy logs and covering them with its foliage, which is at times delicately tinged with purple. There seems to be a wonderful atmosphere of purity about this flower, and it is said to have been frequently employed in the decorations of some of the old masters. In England it has been called hallelujah, "by reason," says an old herbalist, quoted by Britten and Holland, "when it springeth forth and lowereth [*i. e.*, between Easter and Pentecost] alleluia was wont to be sung in the churches." Its three heart-shaped leaflets set tip to tip and suggesting the idea of tri-unity, have doubtless helped to link it to religious associations.

Standing down by the stream's edge and looking upward at the tall cliffs, rounded out in places like towers, we can see, here and there far above us, little balconies made by the jutting rocks. Upon such ledges many ferns and flowering plants find lodgment, forming natural window gardens. Most noticeable among them, perhaps, is the Harebell (*Campanula rotundifolia*), the blue-bell of Scotland famed in song. The beautiful blue blossoms droop over the face of the rocks and sway gaily from their airy heights, like bells on their tower. On windy days what a fairy tintinnabulation they must make, swinging in the breeze—tongueless chimes, as musical to the ear of imagination as the poet's "horns of Elfland faintly blowing!" The blue of the flower is said to make a good ink when extracted; but I should not like to trust anything very important to it, for the corolla speedily becomes white in the press. The plant presents a special feature of interest in the wide dissimilarity existing between its stem-leaves and root-leaves—the latter (which give to it its specific name) being small, round and during the flowering season few in number, while the stem leaves are long and narrow and quite numerous. The radical leaves are therefore apt to be overlooked entirely by the inexperienced botanist, and the plant may on that account puzzle him at first; but a little search will probably always be rewarded by finding enough of them to identify his specimens. Before and after the time of blooming, I believe they are more numerous. For some interesting observations on the leaves of this plant, see article *Campanula rotundifolia* in Thomas Meehan's "Native Flowers and Ferns of the United States."

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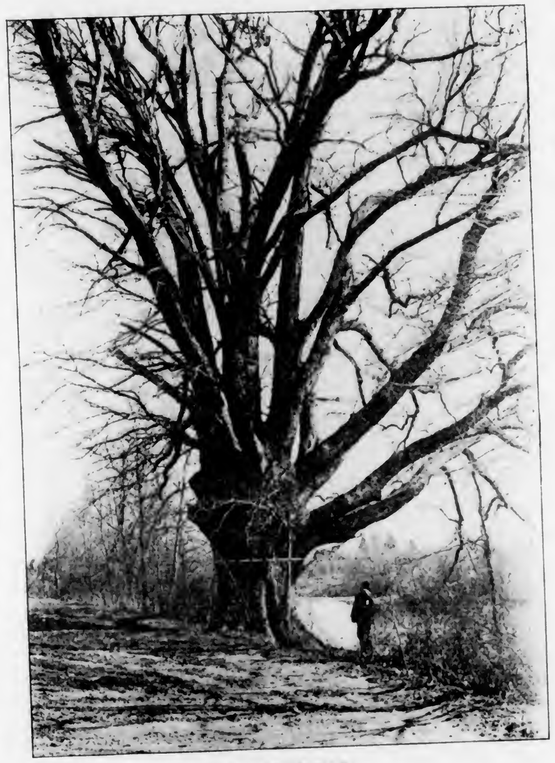
TWO BIG OAKS,—THE SISTERS. — On the bank of Cooper's Creek, about four miles from Camden, New Jersey, two very large White Oaks stood. The property was once owned by a Mr. Kay, who named them for his two daughters. These trees survived the family so long that the writer was unable to learn the names given them, and the trees seem to be the only memorial of the family. One was prostrated by a strong wind about two years ago. The one still standing measures twenty feet in circumference, in height about seventy-five feet and the branches extend from the trunk about thirty-five feet each way. The fallen one was seventeen feet in circumference, and two hundred and sixteen fence posts were cut from the branches. We think the practice of planting and naming trees as memorials an estimable one, and a tablet giving the date of planting should be attached.

RODOLFUS BINGHAM.

Camden, N. J.



A LARGE OAK.

The attaching of the names of friends to trees is a pleasant practice. This can be done either by planting a tree especially for the person, or by associating the name with one already growing. The Herne of Shakespeare did not plant the oak,—but Herne's Oak is just as famous as if it had been planted for him or by him. It is to be regretted that the name of the lady who was associated with this grand old oak cannot now be given. Certainly it would add materially to its interest. A White Oak is a pleasure in itself.

A PLEA FOR SENTIMENT.—Sometime ago, I showed a gentleman around our greenhouses. He is commercially interested in arboriculture. As I pointed out to him various beautiful plants, his remarks forced me to believe that he looked at everything through monetary spectacles, and that he had mistaken his vocation in his choice of a profession: "Not any money in that thing." "Doesn't pay." "No good commercially." "Only a wild flower." "No room for accentiment," etc.

"No room for sentiment!" Yet sentiment rules the world. A nation without the sentiment of patriotism has seen its best days. The sentiment of love is stronger than death. A people without the sentiment of taste, *i. e.*, love of the beautiful, is reverting to barbarism.

The florist and landscape gardener, at every step, appeal to sentiment for support. Poets and painters in all ages have expressed their admiration for flowers, these living gems of nature. And the landscape-gardener of to-day must be a man with a correct knowledge of the principles of art and be thoroughly imbued with the sentiment of taste.

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INTENTIONAL SECOND EXPOSURE

THE FLOW OF THE SAP.—In the August MONTHLY, page 144, I note some exceptions to Mr. Wheeler's views in regard to tree sap. If a pile of bladders should be made, the lower ones filled with brine and the upper with sugar solution, there would be no *flow* in either direction sufficiently pronounced to be called a current. But if the bladders were confined in a vessel, a tub for instance, the salt of the lower solutions would work through the walls of the adjacent bladders and finally into the sugar solutions in the upper row. The same process would be carried on in the reverse direction as well, until a condition of equality should be reached between the two solutions. While this is a crude illustration, and in practice would be slow, on account of surface evaporation from the bladders, it illustrates the movement of sap as given in the best text books. That is, the "flow" is transferrance by osmosis of more or less dense liquid from one cell to adjacent ones.

If your correspondent will turn to Johnson's "How Crops Grow," (1894) pages 376–385, he will find the direction of "flow" discussed at length, especially pages 382–83. "The substances which are organized in the foliage of a plant, as well as those which are imbibed by the roots, move to *any* part where they can supply a want," page 384. "The fact that they chiefly follow certain channels, and move in this or that direction, is plainly dependent upon the structure and arrangement of the tissues, on the sources of nutriment, and on the seat of growth or other action," page 385.

Since the roots imbibe moisture and the substances in solution, and the leaves evaporate most of this, there must be an upward movement of sap toward the evaporative portion—the leaves. And if all the moisture thus distributed is not evaporated there will be formed a return movement which will carry in solution the more highly org nized elements which the leaves have produced. This downward "flow" is strongest when evaporation is least, that is at night; and an additional reason is given by your correspondent—the elaborated sap is needed in the formation of the new cells which give the increase of girth shown by his figures.

In Goodale's "Physiological Botany," page 321, we find that "starch is the first *visible* product of assimilation." On the next page we find that the starch has been found to go through the process of reduction as follows: Starch ($C_6 H_{10} O_5$) in presence of carbonic acid ($C O_2$) and water ($H_2 O$) gives rise to formic acid ($C H_2 O_2$) thence into formic aldehyde ($C H_2 O$) which is the same in the atomic proportions as glucose ($C_6 H_{12} O_6$). Sachs (Physiology of Plants,) page 358 describes the "translocation" of starch, in which the transitory starch repeatedly undergoes solution, osmosis, and reformation until it is transformed into tissue or permanent starch at the point when it is needed, but he does not say how the solution is effected.

FREDERICK H. BLODGETT.

New Brunswick, N. J.

THE CUCKOO-FLOWER, CARDAMINE PRATENSIS.—I have been much interested in the behaviour of some plants of the cuckoo flower, (*Cardamine pratensis*), which is also called meadow cress and is the plant alluded to as the Lady's Smock in Shakespeare's lines:

> "When daisies pied and violets blue
> And lady's smocks all silvery white
> And cuckoo buds of yellow hue
> Do paint the meadows with delight!"

The plant bears pinnate leaves, but the leaflets are but lightly joined to the midrib and the slightest touch causes them to fall from the plant, leaving the bare mid-rib with perhaps a few leaflets remaining. Something of the kind has been observed in the horse-radish, an allied cress with the same natural habitat as the cuckoo flower; but in this the branchlets dropped off to float away and form new plants. Why the cuckoo flower should drop its leaflets does not seem so clear.

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He dug them out in the spring and found them *all sound*, not one rotten, and the outside of the sack was white with roots grown through. This corroborates my idea.

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PLANERA RICHARDI. — It may be well to note that the plants mostly known in nursery catalogues and gardens as *Planera* have been mostly removed to *Zelkova*, by botanists. *Planera Richardi*, the beautiful, elm-like, hardy ornamental tree is *Zelkova crenata*. Indeed, the only species botanists have left to *Planera* is our North American *P. aquatica*. The fact illustrates how difficult it is to change botanical names after they once get into general literature. It is many years since the *Gardener's Monthly* pointed out that *Planera Richardi* should be called *Zelkova crenata*. Meehans' Catalogues have persistently listed it as *Zelkova crenata*.—but the customers continue to complain that they "have by some mistake received *Planera Richardi*, which they already have."

THE FLOW OF THE SAP.—In the August MONTHLY, page 144, I note some exceptions to Mr. Wheeler's views in regard to tree sap. If a pile of bladders should be made, the lower ones filled with brine and the upper with sugar solution, there would be no *flow* in either direction sufficiently pronounced to be called a current. But if the bladders were confined in a vessel, a tub for instance, the salt of the lower solutions would work through the walls of the adjacent bladders and finally into the sugar solutions in the upper row. The same process would be carried on in the reverse direction as well, until a condition of equality should be reached between the two solutions. While this is a crude illustration, and in practice would be slow, on account of surface evaporation from the bladders, it illustrates the movement of sap as given in the best text books. That is, the "flow" is transferrance by osmosis of more or less dense liquid from one cell to adjacent ones.

If your correspondent will turn to Johnson's "How Crops Grow," (1894) pages 376–385, he will find the direction of "flow" discussed at length, especially pages 382–83. "The substances which are organized in the foliage of a plant, as well as those which are imbibed by the roots, move to *any* part where they can supply a want," page 384. "The fact that they chiefly follow certain channels, and move in this or that direction, is plainly dependent upon the structure and arrangement of the tissues, on the sources of nutriment, and on the seat of growth or other action," page 385.

Since the roots imbibe moisture and the substances in solution, and the leaves evaporate most of this, there must be an upward movement of sap toward the evaporative portion—the leaves. And if all the moisture thus distributed is not evaporated there will be formed a return movement which will carry in solution the more highly organized elements which the leaves have produced. This downward "flow" is strongest when evaporation is least, that is at night; and an additional reason is given by your correspondent—the elaborated sap is needed in the formation of the new cells which give the increase of girth shown by his figures.

In Goodale's "Physiological Botany," page 321, we find that "starch is the first *visible* product of assimilation." On the next page we find that the starch has been found to go through the process of reduction as follows: Starch ($C_6 H_{10} O_5$) in presence of carbonic acid ($C O_2$) and water ($H_2 O$) gives rise to formic acid ($C H_2 O_2$) thence into formic aldehyde ($C H_2 O$) which is the same in the atomic proportions as glucose ($C_6 H_{12} O_6$). Sachs (Physiology of Plants,) page 358 describes the "translocation" of starch, in which the transitory starch repeatedly undergoes solution, osmosis, and reformation until it is transformed into tissue or permanent starch at the point when it is needed, but he does not say how the solution is effected.

FREDERICK H. BLODGETT.

New Brunswick, N. J.

THE CUCKOO-FLOWER, CARDAMINE PRATENSIS.—I have been much interested in the behaviour of some plants of the cuckoo flower, (*Cardamine pratensis*), which is also called meadow cress and is the plant alluded to as the Lady's Smock in Shakespeare's lines:

> "When daisies pied and violets blue
> And lady's smocks all silvery white
> And cuckoo buds of yellow hue
> Do paint the meadows with delight!"

The plant bears pinnate leaves, but the leaflets are but lightly joined to the midrib and the slightest touch causes them to fall from the plant, leaving the bare mid-rib with perhaps a few leaflets remaining. Something of the kind has been observed in the horse-radish, an allied cress with the same natural habitat as the cuckoo flower; but in this the branchlets dropped off to float away and form new plants. Why the cuckoo flower should drop its leaflets does not seem so clear.

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INTENTIONAL SECOND EXPOSURE

HAIRBALLS IN HORSES.—Prof. T. V. Coville, botanist in the Department of Agriculture, at Washington, has rendered good service to practical botany by examining the hairballs found in the intestines of some dead horses, in cases where the death was supposed to be from feeding on Crimson Clover, *Trifolium incarnatum*. He finds the mass forming the balls is made up of hairs, which, under a microscope, are exactly like the hair found on the calices of mature Crimson Clover. He concludes that the death does occur from this cause, as the owners of the horses believe.

The whole subject is interesting, and deserves further investigation. These balls, occasionally found in the stomach and bowels of horses, have hitherto been regarded as coming from horses licking themselves. The balls are supposed to be made up of their own hair. But as they do not take this hair all at once, it is not clear how it takes on the perfectly globular form, often several inches in diameter.

Prof. Coville notes that some of these balls have been found to be composed of the beards or awns of grain. Careful records of this do not appear in usual works of reference. As these are extremely brittle, it would seem difficult to have them wound into balls. In like manner it seems difficult to understand why a plant hair should not be as dissolvable by the gastric juice as well as a piece of straw, or the chaff of the grain on which the awns grow. But Professor Coville reports three balls in the bowels, that must have been a long time previously being formed in the stomach. A remarkable feature of the case is that all the hairs are said to be so arranged in the ball that the larger ends are directed towards the centre of the ball. As some of these balls if made of plant hairs in this way, must have been weeks if not months in the construction of a ball, three or four inches in diameter, and which is described as almost as solid as wood, the attendant phenomena seems so little in accord with the general knowledge of things which should have some connection therewith, that there seems a wide field yet left for original discovery.

PROVIDENT HABITS IN ANIMALS.—It is not only the busy bee and the industrious ant that look out for the "Rainy day." Mr. E. Newlin Williams has this to say for the squirrel.

The Tulip Tree seems to have too grand a blossom for a northern tree. It would better fit the southern forests, setting off its magnolia cousins with its own handsome shining leaves and the royal orange and yellow of its splendid flower cup. I once saw a great mound of its winged seeds gathered at the foot of a tree near a squirrel hole. They had not been nibbled at, but as it was early in the season they were probably intended for use later, in case of a scarcity of chestnuts or acorns or beechnuts. I have sometimes stood under the trees, whose lowest limbs are generally fifty feet above me, and wondered how I should get my subject between my thumb and finger ; the grove is a long way from ladders and line-men, and it would be too long to wait until a tempest should come to blow off a branch, as the devotees of India wait under the tree for the sacred leaf which never falls."

THE SCOURING RUSH. — A correspondent writing from Lake George, New York, speaks of the abundance of the Scouring Rush *Equisetum hyemale*, which is called there the "Dry Rush."

"I found it growing near an old stump. It pulls apart at the joints and reminds me of a jointed fishing rod. The old gentleman says that, if placed under a glass, one may find the stalk covered with little white crystals and that the natives hereabouts dry and preserve them for the winter to use in shining pots and kettles."

Its scouring abilities are well known. Other members of the horse-tail family, or equisetums are useful to man. One species—the "brule" of the Indians,—furnished luxurious living to Fremont's starving horses, on his memorable expedition across the Continent. In the coal age, some of the family helped materially in forming the carbonaceous deposit which is so essential to modern civilization.

A HUGH GRAPE VINE.—Mr. Edward Tatnall reports that there is a grape vine, of the "Fox" or Labrusca species, near a famous Indian spring of water at Granogue, in that State, which measures at one foot from the ground five feet nine inches in circumference. At about four feet from the ground are two branches measuring three feet two inches and three feet five inches respectively.

GENERAL GARDENING.

THE FEATHERED CHOIR.

The birds, who make sweet music for us all
In our dark hours, as David did for Saul.
The thrush that carols at the dawn of day
From the green steeples of the piney wood ;
The oriole in the elm ; the noisy jay,
Jargoning like a foreigner at his food ;
The bluebird balanced on some topmost spray,
Flooding with melody the neighborhood ;
Linnet and meadow-lark, and all the throng
That dwell in nests and have the gift of song.

—LONGFELLOW

HENRY A. DREER'S ESTABLISHMENT.—Mr. Dreer's generous invitation to the florists and gardeners in and around Philadelphia, to visit and inspect his large greenhouse establishment, at Riverton, N. J., on August 31st., was met with a hearty response. Taking advantage of the opportunity offered to go over these well-known grounds, the writer, in company with hundreds of other guests, partook of the generous hospitalities of the proprietors.

To say the least we were agreeably surprised to note the many choice plants and their well-kept appearance. Mr. Dreer is an extensive grower of palms, and house after house is filled with various varieties in their different stages of growth. The readers of MEEHANS' MONTHLY will recall the notice given of the one acre greenhouse erected last year. This house is now a pleasing sight, filled, as it is with young palms, chiefly of one species. Another house, of similar build, is in course of erection, and we believe it is to be devoted to palms also. The raising of aquatics, both hardy and tender, is claiming their considerable attention. Permanent tanks for raising the tender sorts occupy several houses, while outside are other tanks and tubs in which may be seen a great variety, in all sizes and colors of bloom. The famous *Victoria Regia* is here attracting particular attention on account of its being in bloom for the first time on these grounds. Among others we noted the following tender varieties: *Nymphæa cœrulea, N. Zanzibarensis, N. var. azurea and rosea, N. delicatissima, N. Devoniensis, N. O'Marana, N. Smithiana*, etc.

We might here call our readers' attention to the fact that it is not necessary to have large ponds or tanks before the pleasure of growing aquatics may be had. They may be raised in tubs in the conservatory, or sunk in the earth outdoors, fresh water being added occasionally. They are easily handled and will speedily repay the little trouble. Tender ones are easily kept over winter in warm moist earth.

A curious plant in a tub in one of the houses attracted our attention. The common name of Lattice-leaf Plant will probably present to the imagination of the reader an idea of the appearance of the leaf which it appropriately describes. The leaf of this plant was probably six inches long, and a network of veins is apparently its only constituent. In reality a thin almost transparent tissue is present. Fragrant spikes of pure white flowers are produced at all seasons of the year. It is a native of Madagascar, and is botanically known as *Aponogeton fenestrale*.

A large field of blooming cannas are very striking in the mass of varied color which their great assortment presents.

Ferns in large numbers and varieties are raised, and do not fail to impress all lovers of these graceful plants.

A large block of Hermosa Roses in full bloom reminds one of its value as an everbloomer.

In one of the large sheds an admirable display of tomatoes and canna blooms was made. The forms showed a remarkable success in development,—not particularly in size, but in shape and in smoothness.

By means of a thorough system for watering few of Mr. Dreer's plants show the effects of the season's drouth, and he is to be congratulated on the excellent appearance of the stock.

WHITE PERENNIAL LUPINE.—I have noticed in two recent numbers of your interesting publication, that the white form of *Lupinus perennis* has been found by correspondents. It is a pleasure to be able to record the fact, that as I

was travelling by rail last June, two stations from here, I noticed quite a little colony of beautiful pink Lupines growing on the dry sandy bank of the railway, a few whites cropped out among a host of the common blue,—and were distinctly visible from the cars. Later, I drove to the place and transplanted two of the roots,—or rather I should say, tried to transplant, for I found that the roots went down indefinitely into pure white sand, and the plants have not taken kindly to the root pruning they had to submit to. We hope to make them live, as it seems about the only way to get this pretty form in our gardens. If I went to collect the seeds, it is most likely they would be scattered by their own peculiar method; and if we covered the flowers with mosquito netting when in bloom, the chances are the seeds would not be produced owing to lack of insect agency. In any case we want to get this pretty form in our gardens if possible, and I know of no other instance of its having been found wild. E. O. ORPET.

South Lancaster, Mass.

When we examine the lupine closely, by cutting open the keel carefully, just before the flower is ready to open, we find that the anthers shed the pollen on the stigma before it emerges. It is a self-fertilizer, as are nearly all the large family of the Leguminosæ. The idea that they require insect aid for pollination is one of the broad generalizations from a few isolated observations that have done much to discredit some great names. We have no hesitation in saying that anyone who will save seed of these white lupines will find an abundant white flowered progeny, though the parent plant were growing among an acre of blue ones.

Flowers under gauze or defenses against insects, fail to seed sometimes, from other causes than a want of proper pollination. Thus Mr. Darwin's clover would not seed under protection, in the dull light and moist climate of England,—but the plants seed just as freely under protection in America as if insects had access to them.

ABNORMAL GROWTHS.—The discussion in a recent issue, of the form and manner in which the stipules of the *Liriodendron* leaves were placed on the pedicels, reminds me of a similar case. The editor of the *Orchid Review* was endeavoring to define for the benefit of the readers what constitutes a species among Cattleyas, and in classifying the Labiata group, he said "Pseudo bulbs clavate, always monophyllous, lip entire. *Orchid Review* 1895, p. 268," in our house we had at that time five instances where the bulbs of plants of this particular group had two leaves each, and now we have quite a number more. When calling attention to this fact, the editor said, *Orchid Review*, p. 114, 1896, the description "would have been better expressed as 'Pseudo bulbs normally monophyllous.'" This is only another instance where Dr. Gray's teachings would fit in admirably, "that vain is the attempt to draw an absolute line between varieties and species." Nature in some of her moods is fickle indeed.

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THE PAINTED-CUP—CASTILLEJA COCCINEA.—A number of parties have sent this season specimens of this showy wild flower, *Castilleja coccinea*, to inquire its name. The common name, Painted-cup, is more appropriate than usual, for it is the bracts or "cups" enclosing the flower, which give the gaudy scarlet attractiveness. It is an annual, but is said not to take well to cultivation. It is one of those species of plants which seem approaching towards root-parasitism.

AQUARIUM MANAGEMENT. — Aquariums prove unsatisfactory sometimes because of the fish becoming diseased or die outright. Generally this is from the want of a due supply of oxygen which water plants are to supply. The bad air or carbonic acid which the creatures exhale, the plants feed on. Too much importance is given to having plants which grow wholly under the water, or at best have a few leaves floating on the surface. But bog plants, or those which grow only partially under water, will keep fish just as healthy, and be much easier managed than those we usually see. With this is an illustration of a very successful one, drawn from nature by Miss Johanna Bedmann, for a beautiful little German work which may be translated as a "Practical Handbook of House Gardening." Some of the plants in this successful aquarium are rare; but the main vegetation composed of grass is only the common Rice plant. The arrow headed leaves are of the *Saggittaria Montevidensis*, but nearly all our river banks and ponds have some species of the arrow head that would do just as well.

The upright narrow leaves are of a swamp sedge grass, *Cyperus Natalensis*, while the commonly cultivated *Tradescantia zebrina* hangs over the water's edge. Any of these trailing Tradescantias grow very well with their roots under the water. The plants have to be planted in mud, but heavy gravel which the fish cannot upturn, keeps them from making the water dirty. Even flat plates of terra cotta could be so arranged as to protect the mud.

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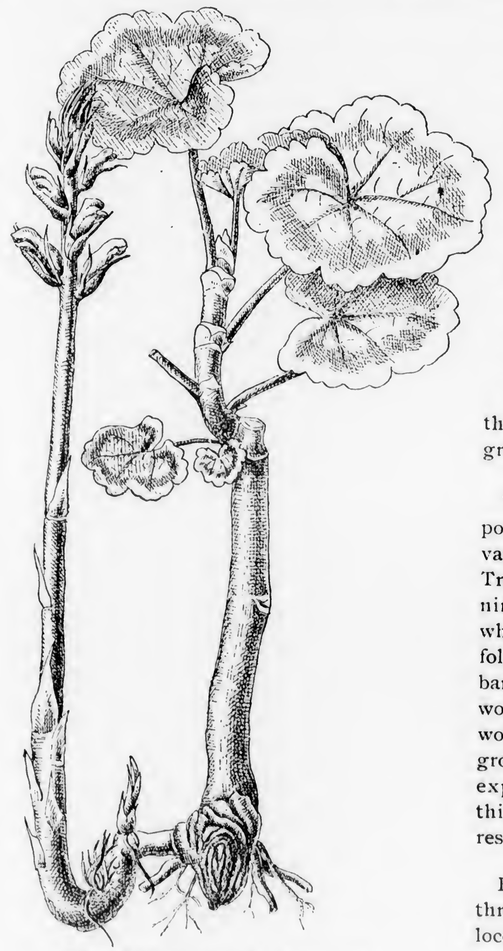
AQUARIUM PLANTS.

INTENTIONAL SECOND EXPOSURE

A Beautiful Root Parasite. — A florist near Philadelphia was dumbfounded a few years ago to find sprouts bearing no leaves, but with beautiful purple flowers, coming up in the pots in which were geraniums growing. Sent to the writer for examination, it proved a case of parasitism, one of the Broom Rapes, *Orobanche cærulea*, an European species, had its seed in some way brought with the soil, and, sprouting had made itself at home by attaching itself to the geranium. They came up in large numbers, and the florist had numerous visitors to see the curious sight of two such distinct flowers growing from one stem in the same pot. These Broom-rapes usually confine themselves to some few particular plants. The clover is a favorite host-plant with this, and it was a surprise to see it make a choice of the geranium in such a free-booting way.



ROOT PARASITE ON A GERANIUM.

We now find in the French *Lyon-Horticole* that in that country it has made a similar choice of a geranium, and it gives the annexed illustration of a case.

It is said of some insects, that, though they seemingly confine themselves so strongly to certain plants that they would go out of existence if the plant were to go away,—they for all this will not starve, but select something else when their favorite disappears. And it does seem the same in the vegetable world, the Clover Broom-Rape will feed on the clover plant when it finds it, but will make no mouths at having the geranium for a second choice.

Fertilizer for Lawn Grass and Shrubs.—A correspondent from Reading, Pa., asks what is the best fertilizer for lawns and shrubs. He has been using bone meal with unsatisfactory results. Good stable manure applied in the fall or early winter, and suffered to lie till spring, so that the rains may carry the fertilizing material into the earth, is by far the best. The only objection to its use is its unsightliness. But this is not a serious objection during the bleakness of winter time, when the lawn grass itself is brown.

Trees Struck by Lightning. A correspondent from Montgomery County, Pennsylvania, writes for advice regarding a Tulip Tree which has had its bark riven by lightning. If such trees are fatally injured, the whole of the foliage soon gets brown. If the foliage be green after a few weeks, the loose bark should be cut away, and the exposed wood painted. The object is to keep the wood from decaying until new bark shall have grown, so as to meet and cover the wood now exposed. It may take several years to do this ; but if the wood is kept sound no serious results will follow.

Forest-Fire damages.—For loss of timber through a forest fire caused by a spark from a locomotive in New Jersey, the West Jersey and Sea Shore R.R. had to pay W. T. Abbott $1,725.

Gardening at Memphis, Tennessee.—A correspondent does not give a glowing account of an intelligent taste for gardening about Memphis, Tennessee ; and speaks of the effect of the summer drouth and heat as still more discouraging.

Copper Solutions as a Fungicide.—It is all too true that those who have made discoveries of immense value to mankind, are generally unknown to history, or receive poor thanks for their services. The use of copper solutions in destroying destructive funguses is now so general, that the cultivator would be regarded as an idiot who was ignorant of their value. Yet no one knows who was the original discoverer. It was in general use among intelligent agriculturists a half century ago, when the writer was a boy. Copperas was then simply dissolved in water, and the seeds steeped therein before sowing. Though not as much was known in detail of the habits of these low perasitic organisms, it was well understood that the spores were carried to the growing plant through the agency of the seed, and that the copper solutions destroyed the spores, and thus saved the crop from injury. The greatest advances in its use have been made by the improvement in spraying machines and implements by which the application can be made at any period of the plant's growth.

NEW OR RARE PLANTS.

Plumbago Larpentae.—During the whole month of September, the purplish blue of the *Plumbago Larpentae* is one of the brightest ornaments of the hardy flower garden. Though still comparatively rare, it has been introduced from China for nearly half a century. It grows only about six inches high, so is well adapted for bordering. One of its merits is that it takes good care of itself without a tendency to travel beyond the limits desired. Some who complain of hard botanical names have come to calling it Lady Larpent's Plumbago,—but how much easier the name is made by merely changing the æ in Larpentæ, to an s, and adding the additional word Lady to an already long name is not clear. Moreover it is not Lady Larpent's Plumbago. It is just possible that, though named in honor of the lady, she never actually saw the plant. There may be a good reason for having English names to all flowers,—but that botanical names are any harder than English ones is the argument of a child.

Flowering Onions.—Your note as to these as garden plants is quite acceptable, for the average cultivator knows nothing of them except as of culinary value in *Allium Cepa*, and perhaps a little of *A. Schoenoprasum*, as Chives in salads. There are two from Central Asia, and we are indebted to the efforts of Regel for the introduction of these and many other fine hardy garden plants. One called *Allium Ostrowskyanum*, has flowers of a bright deep rose color, and another, *A. Karataviense*, has huge spherical heads of purplish blossoms, with generally two very large orbicular leaves prostrate on the soil also of a purple color. These two are easily obtained from Dutch growers of bulbs, and it would be hard to name two more interesting hardy bulbs, as well as being ornamental. They both come from Turkestan. E. O. Orpet.

Actinomeris squarrosa. — Remembering the interesting account of this plant in Vol. I of "The Native Flowers and Ferns of the U. S." I was gratified to make an acquaintance with it this summer in the mountains of western North Carolina. I noticed it in several localities in a trip covering about 150 miles, but always I think near dwellings. Sometimes it grew on the edge of gardens, and sometimes along fence rows. I have no recollection of seeing it in places purely wild. Possibly its presence where I saw it, is due to the introduction of the seed from the west. The yellow ray flowers drooping almost perpendicularly and the arrangement of the inflorescence in compound, rather flat-topped corymbs surmounting the tall slender stalks, make it a plant to attract attention. While it may lack delicacy of beauty, it possesses a decorative quality that doubtless made it of value in the English gardens, where as your article states, it was introduced many years ago. C. F. Saunders.

Philadelphia.

The plant seems to love garden culture. During the last of August, and the whole of September, it is one of the showiest of garden flowers.

VERNONIA LETTERMANII. — This species named by Dr. Engelmann several years before his death, for the energetic botanist and collector, Mr. A. Letterman, is one of the handsomest of hardy border plants, having a rich supply of bright purple blossoms, through the whole of September. It has much the look and habit of some of the narrow leaved species of *Liatris*, until its flowers open and show its true relationship.

CARYOPTERIS MASTACANTHUS.—*Caryopteris mastacanthus*, the so-called Blue Spiræa, is proving of great interest, with its dense whorls of rich deep blue flowers in late September, continuing till frost. Much after the habit of the Desmodium, this probably will kill back nearly if not quite to the ground yearly, but will not kill out completely unless present indications and reports are decidedly wrong. We are indebted to China for this acquisition.

JACOB W. MANNING.

LILIUM LONGIFLORUM AND LILIUM HARRISII.—In the olden times, a single plant might be introduced from a distant land,—and all propagated from it would be identical in all respects. If the introduced plant should be a giant of its race, or a mere dwarf, the stock propagated from it would continue the habits of the original. The Japan Lily, known as *Lilium longiflorum*, seems to have been the case of a dwarf. When the plant known as *Harrisii* was introduced it was so far above the old centurion that it was properly regarded as a distinct variety, and Bermuda became famous for its superior lilies. It now turns out that this Bermuda form is but the regular type of *Lilium longiflorum*. The bulbs of this from Japan are just the same as the bulbs from Bermuda. It was the old denizen of our greenhouses that was the exceptional variety.

DODECATHEON MEADIA AND SPIGELIA MARILANDICA.—Mr. F. K. Steele, Festus, Jefferson Co. Mo., says that "in the woods of this locality there is a plant which I do not see catalogued. Gray calls it *Spigelia Marilandica*. It has a local name in this country of North Carolina, Pink Root. It has a trumpet-shaped flower like the Coral Honey Suckle. (The *Lonicera sempervirens* goes by that name in Maryland, from its bright coral-red berries). In the inside of the tube it is bright yellow. It has terminal cymes crooked or one sided, with flowers an inch and a half or more in length. In the rich woods in the south-eastern countries of this State this plant grows in the utmost profusion, to a height of two feet; and its showy blooms, in contrast to its dark green leaves, make it worthy of a place in any one's garden. There is still another wild plant which I would like to bring to your notice, it is the *Dodecatheon Meadia*, or Shooting Star. I met with it this season for the first time. It has reflexed petals of a hue of pink that is seldom seen on a flower. The bases of the petals are purple with a yellow center. Both of these plants are perennials and when once planted are always planted."

The last sentence in, our good correpondent's note, requires some qualification. They do not stay always planted, but die out in time, unless the conditions are favorable. They have often been introduced into gardens, but we still have to place this paragraph in our rare plant department. The *Spigelia* evidently desires shade,—while the *Dodecatheon* evidently pines for the companionship of the wild grasses of its prairie home.

THE HARDY FLOWER GARDEN.

THE GILLIFLOWER.— Fashions in flowers leave some very beautiful and delightful flowers to cold neglect. Few things were more lovely in every respect than the Gilliflower, or "Stockgilly," as they were termed. They are out of date, to a great extent, now.

CONTINUOUS BLOOMING HARDY FLOWERS.— There is much inquiry for hardy perennials that will bloom continuously in the open borders. Mr. Manning says that the *Callirhoe involucrata*, the Poppy Mallow, is nearly always in bloom, and its rich crimson flowers are particularly showy on the vines in early morning.

GAILLARDIA GRANDIFLORA. — One of the prettiest of the wild flowers of the Rocky Mountain region is *Gaillardia aristata*. It is a dwarfish plant, and is rarely found with more than one or two flowers at a time. *Gaillardia grandiflora* is a robust garden variety of this species, and bears abundantly through the whole summer and fall. It defies drouth and heat, and is one of the most desirable of hardy garden flowers.

THE ELEPHANT PLANT.—A correspondent in Philadelphia asks:

"Will you take the trouble to tell me if the Elephant Plant produces a flower?"

The plant referred to is no doubt what is known about Philadelphia as the Elephant's Ear, and in the South as the Tan Yan. Those who are not afraid of being deemed affected, call it Caladium; and as the species is the edible one, it is known everywhere in intelligent circles as *Caladium esculentum*. It flowers in a spathe, much of the form of the "Jack in the Pulpit" or "Indian Turnip" of our woods,—or as the common Calla Lily of the greenhouses. It is late in the fall before the flowers appear, and they are comparatively inconspicuous.

JAPANESE IRISES.—In your notes on these superb garden plants on p. 155, you speak a word for them that is in season. There is a growing demand for this section of the Iris family that is refreshing to see. It was many years before the collection originally brought out of Japan by Thos. Hogg was equalled; indeed, not until quite recently were they beaten by the recent importations. They are of greater average merit than any we have had from the East, and no more beautiful garden plants are to be had. They will simply luxuriate in a swamp even where water or ice may stand two feet in depth in winter, if only there be sufficient supply for their needs in summer. There is in your remarks one that I would take exception to, and that is where you say that "all Irises are moisture loving plants,"—you ought to insert the word Japan, between the first two words of that paragraph. The conditions named would be death to those of the rhizomatous section such as all the German Iris. These never do so well as when planted in sandy soil, hot and dry; and the best time to transplant them is at the time when fall rains begin,—they have been through a season of rest and maturation, and are ready to make a start towards recuperation for the efforts of the next year's growth and early crop of bloom.

E. O. ORPET.

FRUITS AND VEGETABLES.

RIPENING PEARS. — There are few fruits which seem to vary so much in flavor as pears. A variety one person praises, will be denounced by another as of little worth. But a good pear is a product of the gardener's art quite as much as of Nature's whims and fancies. The *Canadian Horticulturist* has the following excellent note which furnishes light on the whole subject:

"It is the opinion of most nurserymen that pears should be picked while green and ripened indoors. The sunny side of the tree should be picked first and the rest later on. The greener the pear the higher the temperature should be to ripen it. The atmosphere should be moist to keep the pears from shriveling. The tasteless pear is the result of too early picking, and should have received more sun and less artificial heat. Such a pear is flavorless, and unfit to eat.

As pears absorb odors readily, much care should be taken that the boxes and papers in which they are packed are kept fresh and clean. Pears not being so elastic as apples, require straw, paper or some such material to keep them from being injured by the sides of the box or barrel. Early pears and those nearly ripe should be packed in shallow, well-ventilated boxes. French gardeners generally pack this fruit in layers with the spaces filled up with powdered charcoal. The largest and greenest fruit is in the bottom, and all so snugly packed that no movement is possible. See that one pear does not press against another."

SPRAYING PLANTS.—Since it has been discovered that solutions of copper will effectually destroy fungus parasites, there is no difficulty in protecting large orchards from mildews and blights which formerly proved so destructive. But for those who have but a few plants and trees to care for, some very simple and easy mode is still wanted. In some large towns parties have made a business of spraying plants for protection, but in most cases these business enterprises have been abandoned. In this locality all the matters requiring attention are so comparatively small that the cost of attention seems out of proportion to the results achieved.

PEANUT CULTURE.—A correspondent complains that he has consulted a number of standard works on agriculture but finds nowhere any information on the culture of the Peanut, and desires us to enlighten him. It so happens that an able article on this very subject has recently been contributed to the New Jersey *Forester*, by Dr. Chas. Mohr of Mobile, who is in frequent request by the United States Department of Agriculture for working up these special subjects. The following abstract of Dr. Mohr's paper will probably fully enlighten our correspondent:

The peanut requires a light porous soil, not too sandy nor too dry, with a fair supply of the nutritive elements required for the successful production of a grain crop. Of all the mineral constituents of the soil required, the presence of lime is most important for the proper fruiting of the vines and perfection of the nuts. On the sandy lands of the Coast Plain, destitute of these elements, the want might be met to the best advantage by the application of about twenty to twenty-five bushels of burnt oyster shells or one hundred pounds of calcareous marl to begin with. These should be plowed in before the final preparation of the soil for planting. In kainit is found a cheap supply for potash; and in acid phosphate for available phosphoric acid.

This manure is best plowed in broadcast early in the season, but might also be spread in the furrow in which the seed is to be planted. The application of proper fertilizers in sufficient quantity is indispensable for the successful cultivation of this crop.

Two bushels of seed (from twenty-four to twenty-six lbs. to the bushel) are required for an acre. The seeds are hulled, care being taken not to break the skin covering the kernel. Experiments have shown that "level" culture is to be preferred to cultivation in "ridges" insuring larger crops, and rendering the old practice of covering the bloom unnecessary. The seeds are either planted in hills three feet in the square, or in drills three feet distant, the hills in the row fourteen inches apart. Two kernels are placed in each hill, and covered to the depth of one and a half or two inches. After the proper preparation of the soil from the start but little tillage is required, the main efforts being directed to the destruction of weeds. The crop should be harvested before the first frost, to keep the quality of the vines for fodder unimpaired and also to prevent injury to the kernel. In harvesting, the vines are plowed up and removed from the ground with the pitch fork, carefully shaking off all loose soil. They are loosely stacked up to insure free circulation of the air under protection from dew and rain. After the vines have been perfectly cured the nuts are ready to be picked.

Fifty to sixty bushels to the acre, by proper fertilizing, good cultivation and a rational rotation of crops, is considered a fair yield. By the neglect of these requirements the average yield in the United States is little over 17 bushels; in Virginia 20 bushels. By a crop of from fifty to sixty bushels to the acre from one to two tons of excellent fodder can be secured, which in its nutritive value compares favorably with the best of forage plants.

A WONDERFUL GRAPE VINE.—Every one has heard of the wonderful grape vine at Hampton Court, the famous palace built by Cardinal Wolsey, which for so many years has borne tons of Black Hamburg grapes, and still continues healthy and bearing wonderfully. The *Journal of Horticulture* says that there are vines equally wonderful, though not as well known, and instances the Manresa Vine. Manresa House is a Catholic college near the village of Roehampton in England. The gardener who planted it years ago, Mr. Davis, is still living. The roots are all out of doors, and the vine has been led into a cold greenhouse, lengthened from time to time. One huge grape vine has therefore the whole house to itself. The house is now one single structure 224 feet long. In the present July there were 921 clusters of Black Hamburgs on the single vine, averaging each a weight of 1½ pounds. The bunches are cut at once on the maturity of the fruit, and sent to Covent Garden Market.

GOOD EARLY PEACHES.—The *Florida Farmer and Fruit Grower* does not think many of the popular early peaches have more than their showy character in addition to their earliness to recommend them. Alexander, it says, is the leading variety extensively planted, but there is no really good peach till the Elberta comes in.

TOMATO CULTURE.—In a recent essay before the Massachusetts Horticultural Society, Prof. W. N. Munson stated that in Maryland alone there are as many as twelve thousand acres devoted to this one crop, while in New Jersey, Delaware, Ohio, Indiana, and Illinois, the crop is of special importance.

By far the larger portion of the area devoted to this crop is employed in supplying fruit for the canning factories, and it is this demand of the canneries which, more than any other, has given the great impetus to tomato culture. The credit of introducing canned tomatoes as an article of trade is due to Mr. Harrison W. Crosby, who made his first venture in 1848, while steward of Lafayette College, Easton, Pennsylvania. There was a ready demand for the goods, and with increased supply and improved machinery, the cost has been reduced from fifty cents per can, in 1848, to seven cents at the present time. With this reduced cost, the output of the factories has increased to an almost incredible extent. The total output for 1894 was nearly six million cases of two dozen cans each, as compared with less than three million in 1887.

NEW GRAPE MCPIKE.—The Silas Wilson Co., of Atlantic, Iowa, have introduced a new grape called McPike. In our climate, it is of the first importance that the plant should be suited to the conditions. We should need nothing better for our gardens than the foreign Black Hamburg, if it would suit itself to our climate; but it will not do that,—and many of our good varieties are nearly as particular. One of those which have been the most satisfied with our climate is the Worden. McPike is a seedling from this, and in our opinion every way superior. The Wilson Company appear to have struck a good thing.

PLANTING RASPBERRIES AND BLACKBERRIES.—All plants which die to the ground in winter make buds for the coming season near to the ground. There are no buds on the main stems. Raspberry and blackberry plants cannot be raised from cuttings of the stems, this must be remembered in planting them. It is the bud near the ground that has to make the plant for next year. If the plants are set deeply, the buds will rot before reaching the surface.

APPLE CANKER IN OREGON.—To the London *Gardener's Chronicle*, Mr. Hedrick, of the Oregon State Experimental Station, sends specimens of an apple canker prevailing in that State, which he thus describes: "About the beginning of our wet season (September or October) there appear on the trunks or branches of our apple trees small reddish sunken spots. During the winter months these spots enlarge, attaining oftentimes a much greater size than those in the specimens sent (2 to 3 inches long). About the middle of June the small perithecia begin to appear. At the beginning of the next rainy season the bark sloughs off, leaving a rough, unsightly wound."

Mr. M. C. Cooke decides that it is the work of a minute fungus distinct from the one which causes the well-known "apple canker" of the Old World, *Nectria ditissima*, but is unable to decide, from the immaturity of the specimens, what species does cause the trouble.

ORIGIN OF OUR MODERN STRAWBERRY.—Prof. L. H. Bailey is credited with the statement that the modern strawberry of gardens is a derivation of the wild strawberry of Chili; Prof. Bailey could scarcely have made this statement. Those who have seen, as the writer has, the Chili Strawberry, growing wild in its native locality, will fail to see the slightest trace of this species in any of our garden varieties. These are undoubtedly improvements pure and simple of our own wild strawberry of the East, *Fragaria Virginica*. Attempts have been made at times to improve the Chili Strawberry, but always with poor success. At the present time it is doubtful whether there is any representative of this species in cultivation.

SCARCITY OF MUSHROOMS.—For all that has been done to simplify the culture of mushrooms, they seem yet among the great luxuries. In many restaurants of the moderate class, where ten, fifteen or twenty cents are quoted for almost any kind of vegetable, the mushroom will be set down at sixty or seventy. The canned French mushroom is cheaper; but one may not know whether he is eating mushrooms or boiled dough noodles, unless told they are mushrooms.

BIOGRAPHY AND LITERATURE.

AS WE SOW SO SHALL WE REAP.

Never rail at the world—it is just as we make it,
  We see not the flower if we set not the seed ;
And as for ill-luck, why it's just as we make it,—
  The heart that's in earnest, no bars can impede.
You question the justice which governs man's breast
And say that the search for true friendship is vain ;
  But remember, this world, though it be not the best,
Is the next to the best we shall ever attain.

—CHARLES SWAIN.

JOHN GOLDIE.—The remark made in the history of the Goldie Fern, that little was known of John Goldie, beyond the statement in "Britten's Lives of British Botanists," that he died at Ayr, Waterloo County, New York, United States, has brought the following correspondence which, instead of a paragraph made up therefrom, we take the liberty to give entire, as it will be of interest to botanists everywhere. The value of any one's work is not known while the seed is being sown. It is only years after, when the sower has departed, and the harvest is being reaped, that the full worth of the services in the field of humanity is fully perceived. The journals of Pursh and Michaux which have been published in our time, and found of profound interest, would have been tame reading if given out at the time. In like manner Goldie's Journal will be anxiously looked for, as promised by his son. He could render no better service to botanists than by the proposed publication, and it would be a good tribute to his father's memory.

"In the leading article in July number of MEEHAN'S MONTHLY, some statements regarding John Goldie were in error. He died at his son David's residence, at Ayr, Waterloo Co., *Ontario, Canada ;* and not in the United States. He had three sons, John, David and James,—the latter is the only one now living. He is one of the largest flour millers in this section of the country. He inherits very largely his father's taste for botany, and especially the wild flowers of Canada. His name is a household word in Canada. James Goldie is a synonym here for all that is honorable, charitable and kind. From him I had the following regarding his father. 'He first came to this country in 1817 at the request of the late Sir William Hooker, to investigate the flora of the country, and returned in 1819. He came finally to Canada with his family in 1844 where he remained until his death.'

"James has an old journal of his father's, the notes of a collecting trip from Montreal to Pittsburgh, Penna., in 1819, and at the request of several friends I think he will have it printed.

"As no doubt you will be pleased to note, in the MONTHLY, some sketch of one who labored so well and with such goods results, if you write to James Goldie, Guelph, Ontario, Canada, he will no doubt give you the facts."

JAMES LOCKIE.

Waterloo, Ontario, Canada.

A letter to Mr. Goldie brought the following fuller account :—

"I duly received the magazines you so kindly sent me for which accept thanks.

"Mr. Lockie I believe wrote you to correct the statement that my father died in the State of New York. He died at Ayr, Waterloo Co., Ontario. I have the journal kept by him on the journey he made from Montreal to Pittsburgh in the year 1819.

"I have arranged, at the request of some friends, to have it printed for private distribution and will have much pleasure in sending you a few copies.

"My Father visited this country in 1817, returning to Scotland, I think, in 1818. He came back again in 1819 and remained, I believe, till 1821. In 1824 he made a collection of plants, trees and shrubs for the Botanical Gardens that were then being constructed in St. Petersburg, Russia, and went there with them. He was connected with the Gardens for some time. He travelled in that country collecting novelties and introduced many fine things.

"He afterwards revisited Russia and Siberia to investigate the rich botanical wealth there. He came to Canada in 1844 with his family and resided at Ayr till his death. Nearly all of his journals and notes of travel in the various countries he visited were lost by the burning of his house, and of course they cannot be replaced."

JAMES GOLDIE.

Guelph, Ontario.

GENERAL DEARBORN.—Of the founder of the famous Forest Hill Cemetery, near Boston, a recent visitor says :

"The diversity of the grounds and the natural features are of immense advantage in laying them out ; nature has lavishly bestowed upon them many fine features, especially in large and conspicuous boulders and natural rock surfaces, all of which have been retained, adding very much to the general effect of the grounds. An interesting and attractive feature is the grotto, or rockery, as many call it, all the rocks, of which there is a great abundance, remaining in their natural positions. This place has been improved by winding paths to the summit, where a rustic summer house is located, affording a delightful resting place. On a projecting point a bridge and a lookout enables the visitor to obtain a fine view of Lake Hibiscus, and the surrounding portion of the grounds. The ornamentation is of hardy shrubs and choice hardy and native plants and ferns, additions to which are constantly being made as the plants are re-arranged and opportunity offers. The highest point at the head of the grotto is Mount Dearborn. On Sweet-Brier path, which forms a part of this elevation, is the lot in which Gen. Dearborn is interred. On it is a handsome marble vase bearing the name, 'H. A. S. Dearborn,' and on the base which supports it is the inscription :

'Erected by the workmen of Forest Hills
Cemetery to commemorate his
many virtues.'

This inscription tells the story of the monument in a simple and appropriate manner, and the flowers with which the vase is supplied testify to the sincerity of the tribute.

On the summit of the hill, but a few steps from this lot, is the Dearborn monument, erected by his friends and fellow citizens. It is an eloquent Corinthian column, of white marble, on a base which extends by scrolls on each side to smaller pedestals bearing funeral urns ; the shaft is decorated with convex flutings ; the capital is elaborately wrought, and is surmounted by a funeral urn with flame. On the front of the base is a raised tablet inscribed as follows :

'H. A. S. Dearborn,
Obiit Julii 29, 1851,
Ætat, 69.'"

The General's name also lives in the memory of lovers of good fruit in the pear, Dearborn's Seedling, one of the best of early varieties.

A TRAVELER'S NOTES.—This is the modest title of one of the most beautiful and interesting works issued from the press for a long time,—but it is only printed for presentation to his friends by Mr. James H. Veitch, of the world renowned firm of James Veitch & Sons, of Chelsea, England. Mr. Veitch went to Ceylon by way of the Red Sea and proceeded northwards through the Madras and Bombay Presidencies, and having penetrated as far as Lahore returned to Calcutta. Leaving India he touched at Rangoon, passing on through the Straits of Malacca to Singapore. From this point he visited Batavia, and returning continued to Hong Kong and China. Making Hong Kong a fresh centre of excursion Mr. Veitch struck north for Japan, whence deviating from the beaten track of tourists, he crossed over to Korea. Retracing his course to Hong Kong he now took steamer for Sydney, and having traversed some 2,000 miles of the Australian Coast as far west as Perth returned to Sydney, and thence set out for New Zealand. Here he concluded his active explorations, embarking for England and coming home by way of Cape Horn and Rio Janeiro.

We can only say that fortunate is he who happens to be on the special list of Mr. Veitch's many friends.

THE NUT CULTURIST.—The last work of the late eminent Horticulturist, Andrew S. Fuller, was to revise his "Nut Culturist." The new edition has just been issued by the Orange Judd Company, of New York. There seems nothing likely to interest any nut grower, but has attention given to it in this work.

GENERAL NOTES.

DEMON FLOWERS.—Charles Fosterman, of San Diego, whose death has recently been recorded, is reputed to have been a great collector of orchids in South America at one time, and appears to have been fond of a joke on the average newspaper reporter, one of whom gives away the following, evidently played off on him by the Mr. Fosterman aforesaid :

"He said he landed once on the coast of Brazil, a few degrees south of the equator, where he met a native chief, who told him of a 'village of the demon flowers' to the westward. Further questioning convinced him that the 'demon flowers' were orchids of the rarest and most wonderful kind, so he decided to find this 'village' at any cost.

He had traveled through forests about six weeks, and was calculating that in a fortnight more he would be in the neighborhood of the 'village of the demon flowers' when, one afternoon, three of his forward guards threw up their arms, and, with a cry, fell senseless to the ground. He had noticed a peculiar sickening odor pervading the heavy, heated air, and quickly gave the order for the other men to advance with caution and drag back the fallen ones from the spot where they lay. They did so, and, returning, reported that they had seen through this dense forest a little further on, the vast 'village of the demon flowers.'

Accompanied only by a Portuguese interpreter, the orchid-seekers started forward, their mouths and noses muffled as a safeguard against the awful odor. They managed to reach the spot where the three men had been stricken down, but could go no further. They could see, a hundred yards ahead of them, a great mass of orchids. Trees, undergrowth, and everything was loaded down with them. They were of hues more brilliant than he had ever seen or dreamed of seeing. But, like a barrier, the wall of awful, sickening, overpowering odor rose between."

This is something like the wonderful Upas tree of Java all over again—a tree under which a veracious traveler found heaps of skulls of those who, sleeping under it, had died. The skulls did not frighten the newly arrived traveler, whose fate was to be next, nor excite a thought as to how they died. In this case the "forward guards" would seem to know how deadly the orchid was, but were going to their death to get some at any rate. How self-sacrificing for the good of science!

PHOTOGRAPHS OF TREES, FLOWERS AND GARDENS.—Mr. E. O. Orpet says:—"If you want to figure a really beautiful specimen of the American Elm, I can send you, I think, a good photo of the largest one in New England, it is also the most perfect in shape, the branches can be touched 'when standing in a team' all round the tree,—the girth is 22 feet, 5 feet from the ground."

Photographs, if of any thing in connection with gardening or wild flowers, are always very welcome to the conductors. You should see the garden album of MEEHANS' MONTHLY.

IMPROVEMENT OF THE TOMATO.—It is rare that it is conceded that nothing more is to be gained in the improvement of fruits or vegetables. But it is admitted on all sides, that the Tomato has reached its limit. No further improvement is looked for in the way of new varieties.

A LARGE HACKBERRY TREE.—Mr. Edward Tatnall, Wilmington, Delaware, reports a fine specimen of the *Celtis occidentalis* on Red Clay creek, below Kiamensi, in that State, which is five feet in diameter,—and four feet in another, the trunk being somewhat ovoid in outline.

CANAIGRE.—Under the name of Canaigre, a species of dock is famous for tanning qualities. It is *Rumex hymenosepalus*. It is well known in Arizona. In the East Indies, another species of dock, *Rumex Nepalensis*, has been equally valuable in a similar line.

SITUATIONS WANTED.

Advertisements under this head, not exceeding 50 words, will be inserted once for 50 cents, or three times for $1.25.

GARDENERS:—We shall be glad to furnish names of competent gardeners adapted to large or small places. Gardeners wishing situations should correspond with us. THOMAS MEEHAN & SONS, Nurserymen, Germantown, Philadelphia.

GARDENER—Situation wanted by a man thoroughly experienced in all branches. Age 38, married, 2 small children. Excellent references. Address, J. W. B., care of MEEHANS' MONTHLY

GARDENER—English, aged 38, married, small family; 24 years experience in growing orchids, ferns, stove and greenhouse plants, roses, carnations, chrysanthemums; also the management of fruit houses, vegetable and flower gardens, etc. State wages. Chas. Dumper, 119 Tallmadge St., Poughkeepsie, N. Y.

AS GARDENER, by a man of experience and ability, will be disengaged 1st of March next, thoroughly conversant with the management of a gentleman's country estate, unexceptional references for ability and personal character.
Address, J. E. S.
Box 103
Toms River, N. J.

HEAD GARDENER—*Estate Manager*—Situation wanted by a theoretical and practical gardener, 27 years experience in Landscape work, cultures under glass or out-doors, all branches of gardening. Best references from *first-class* places. Europe and U. S. February or later, "R. F.," Office, Meehans' Monthly.

GARDENER. Situation wanted as gardener by a thoroughly practical English-American, single, 8 years experience as gardener and florist. Excellent references. Address,
E. A. C., Box 311, Tarrytown, N. Y.

GARDENER—Situation wanted as assistant gardener by thoroughly practical Scotchman; age 25; single; 10 years experience in all branches. Address, D. R., Box 420, Mamaroneck, N. Y.

THE NEW ST. LOUIS

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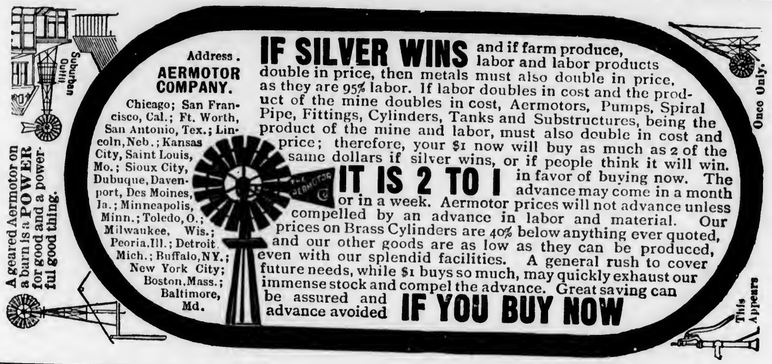
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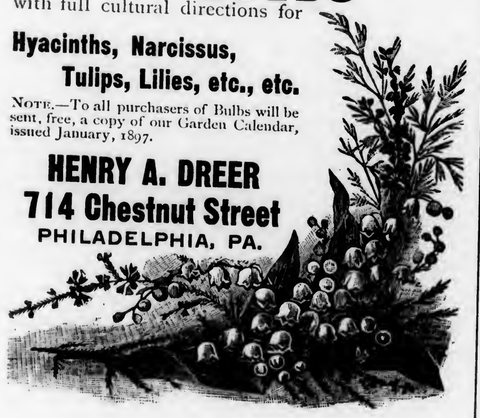

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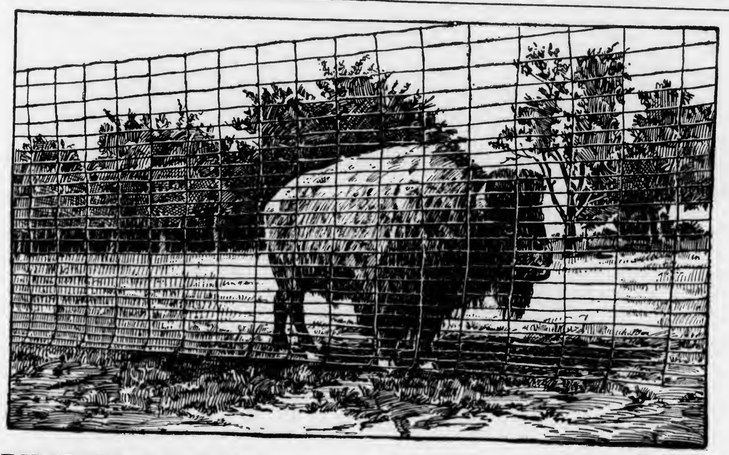

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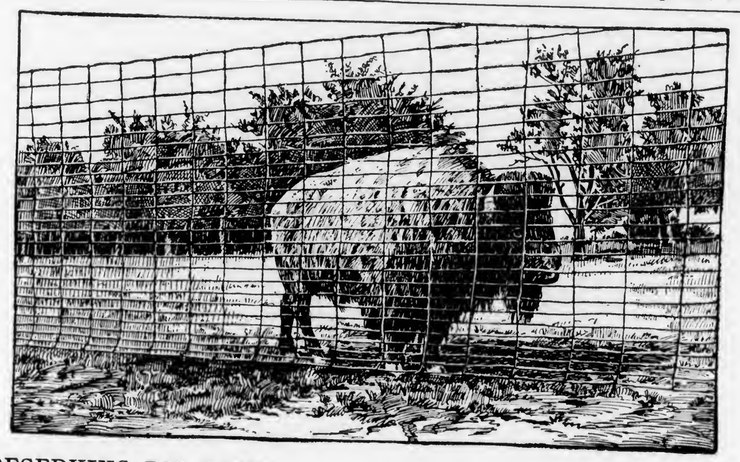

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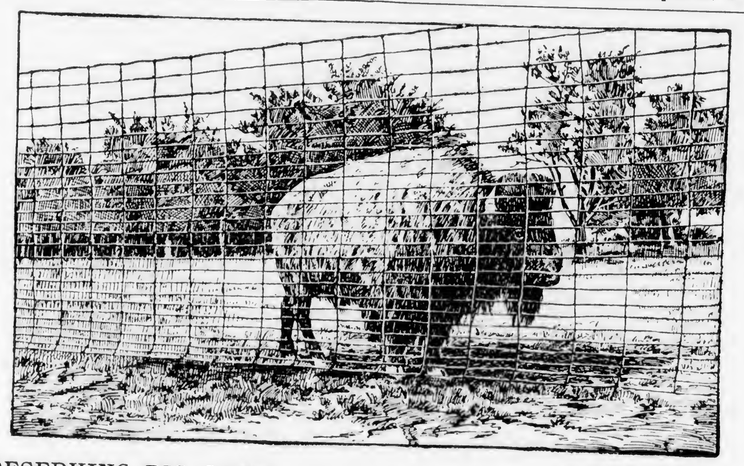

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ADRIAN, Michigan.—The recent death of Austin Corbin, the New England multi-millionaire, at his villa, near Newport, N. H., elicits special interest here. Mr. Corbin has the most extensive private preserve for large game that probably exists, covering 25,000 acres in the Blue Mountain Forest. On this magnificent range much of the Page Woven Wire Fence has been used, the works for the manufacture of which exist in this city.

The great financier had adopted the Adrian product in preference to all others. He had given much attention to preserving from extinction the American buffalo; and one of the stipulations submitted for enclosing his New Hampshire domain was that the fence should be proof against attempts to leap it, or break through, on the part of these powerful and agile animals.

Unlike barb wire and analagous devices the Page product is a protection instead of a menace to animals within its enclosure. A short time ago he donated to the park commissioners of New York, a number of bison from his Blue Mountain herd, with the condition that none but Page fencing be used to enclose them.

Stimulated by Mr. Corbin's example, the Page people have instituted a zoo of their own. A range of 37 acres has been enclosed, and in this the company has placed a number of deer and elk, with nine bison. These were obtained after considerable trouble and expense, so rare are full-blooded specimens of the American bison becoming. Nero, a superb animal weighing 2,000 pounds, died recently from injuries sustained in its transportation to the Adrian park, and has been mounted together with a beautiful elk, and donated to the museum of Adrian college.

Having succeeded so well in coraling the brawny bison, the Page people are now preparing a fence to enclose the elephants in Lincoln park, Chicago, and relieve the animals from the chains which keep them in subjection at the expense of their tempers and physical condition.

The company has also made a tender to the government to enclose a range at Yellowstone Park, and save from depredation and loss the few buffalo that remain.

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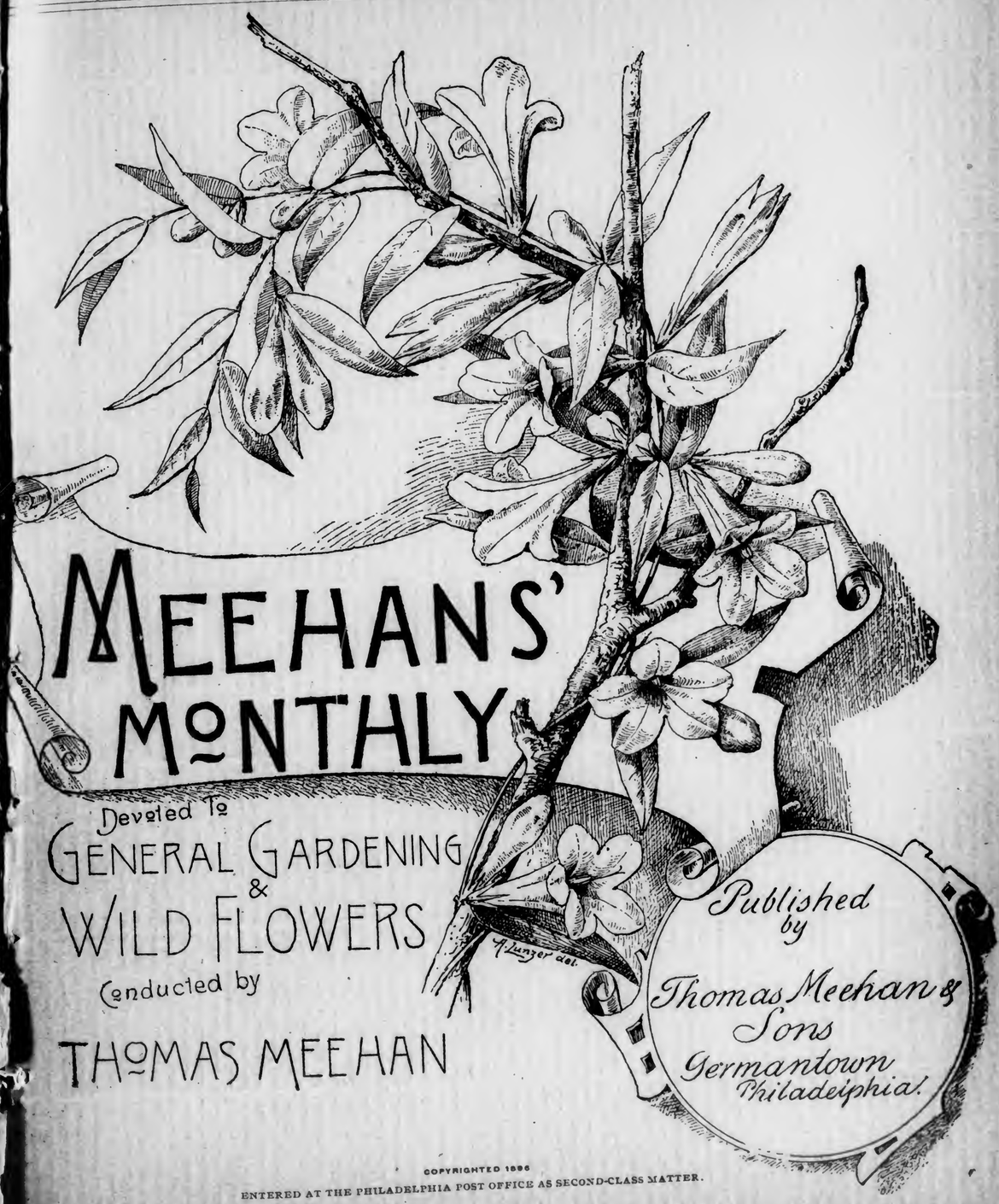

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GORDONIA PUBESCENS

GORDONIA PUBESCENS.

FRANKLIN TREE.

NATURAL ORDER, TERNSTRŒMERIACEÆ.

GORDONIA PUBESCENS, L'HERITIER.—Leaves serrate, thin, deciduous, oblong, cuneiform, shining above, canescent beneath; flowers on short peduncles; sepals and petals silky outside. Wood's *Class-Book of Botany*. See also Chapman's *Flora of the Southern United States*.

It was not the intention to illustrate more than the herbaceous vegetation of the United States, but to leave the larger, woody plants to other pens and pencils,—a work indeed which has been ably undertaken by Prof. C. S. Sargent in the *Silva Americana* since this work was planned. The smaller woody plants have been included, and the *Gordonia* is given a place because, though it has a strong woody growth, it flowers freely as a low bush when but two or three years old.

Various opinions have been expressed by leading botanists as to the name it ought to bear,—but the name chosen from Wood's *Class-Book of Botany* is the name by which it is now generally known. It was first discovered by John Bartram and named in his "Catalogue," *Franklinia Alatamaha*,—the genus in honor of Benjamin Franklin, and the species because he found it only in one place along the Alatamaha River in Georgia, and the name was to emphasize that fact. He considered it a distinct genus from *Gordonia Lasianthus*, a species then well-known and common in swamps along the Southern Atlantic seaboard States. The date of Bartram's first description is unknown, as no copy of the "Catalogue" is known to be in existence, but Marshall, in his *Arbustum Americanum*, published in 1785, refers to it as the authority. William Bartram, son of John, who accompanied his father when they first found the *Franklinia*, left Philadelphia for another extended trip South, in April, 1773, and brought back seeds and plants of the *Franklinia* two years later,—but for some reason or another his "Travels," so often quoted in connection with this plant, were not published till 1791. He states in that work that "We have named *Franklinia*." "We," meaning evidently his father, John, and himself. The European botanists, however, did not regard it as distinct from *Gordonia*, a genus already established; and L'Heritier, a French botanist, gave it the name it now bears, *Gordonia pubescens*. This was in 1784—one year before Marshall published *Arbustum Americanum*. The dates are important in connection with the proper name, as "priority" of publication has much weight in disputes as to the name adopted, though it is doubted by some whether, after a name has been generally adopted, the rule of priority should have much weight. It is worth noting, however, that L'Heritier, in naming *Gordonia pubescens*, imagined he had something else, and gives Bartram's plant on the same page, but following the other, as *Gordonia Franklini*. He says of *G. pubescens* that there had been growing, at Trianon, a somewhat tender plant, blooming late in autumn, the flowers not perfecting till near frost, and the flowers fell before unfolding, so that he could not get an ico It was singular how this plant got s it is evident L'Heritier had no susp was Bartram's plant. Without going urther into these figures and details, it may be said to be granted that if not a true *Gordonia*, its proper name would be *Franklinia Alatamaha* of John Bartram. It is not improbable that this name may yet be adopted in leading botanical works. There is something in what the French call a *coup d' œil*, which often decides when artificial characters fail.

This "glance of the eye" would indicate a relationship with a *Stuartia*, just as readily, at least, as with *Gordonia Lasianthus*, and morphological conceptions justify the glance. Its true position is probably between the two genera where Bartram placed it. Many of the rarer plants of the Southern districts have their counterparts in Japan,—and it may be here noted that, while there are no Gordonias in that country, there are Stuartias in several species.

COLOR PHOTO

GORDONIA PUBESCENS.

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COLOR PHOTO

The history of the discovery is so interesting that Marshall's account is here given in full:—"This beautiful, flowering, tree-like shrub, rises with an erect trunk to the height of about twenty feet, dividing into branches alternately disposed. The leaves are oblong, narrowed towards the base, sawed on the edges, placed alternately, and sitting close to the branches. The flowers are produced towards the extremity of the branches, sitting close at the bosom of the leaves,—they are often five inches in diameter when fully expanded, composed of five roundish, spreading petals, ornamented in the center with a tuft or crown of gold-colored stamina, and possessed with the fragrance of a china orange. This newly-discovered, rare, and elegant flowering shrub was first discovered by John Bartram when on botanical researches, on the Alatamaha River, in Georgia, A. D., 1760, but was not brought into Pennsylvania till about fifteen years after, when his son, William Bartram, employed in like pursuits, revisited the place where it had been before observed, and had the pleasing prospect of beholding it in its native soil, possessed with all its floral charms, and bearing ripe seeds at the same time, some of which he collected and brought home, and raised several plants therefrom, which in four years' time flowered, and in one year after perfected ripe seeds.

It seems nearly allied to *Gordonia*, to which it has in some late Catalogues been joined; but William Bartram, who first introduced it, believing it to be a new Genus, has chosen to honor it with the name of that patron of science, and truly great and distinguished character, Dr. Benjamin Franklin. The trivial name is added from the river, where alone it has been observed to grow naturally. It delights in a loose, moist and sandy soil."

In Aiton's *Hortus Kewensis*, it is stated that it was first introduced there "by Mr. Wm. Malcolm, in 1774." As William Bartram did not start on his trip till 1773, and did not have the seeds in the Bartram Garden till 1775, it is a question where Malcolm got his set from. It indicates two distinct sets of discoveries, and may account for the early plants referred to by L'Heritier, as existing in the French Kings' Garden at Trianon.

Bartram does not seem to have had many plants to distribute,—there are some half dozen old trees about Philadelphia,—and Joshua Pierce, of Washington, of the same family of Pierces which, at the beginning of the century, had a remarkably fine arboretum near to the Garden of Humphrey Marshall, had also of this original stock,—of late years layered plants have been distributed by nurserymen.

The leaves change to a bright crimson in the fall, and add to the interest which the sweet, white flowers gave just before.

The history of the genus *Gordonia* is interesting as showing how great a progress has been made in the real knowledge of plants. The plants now known as *Gordonia* has been long known, but was regarded by some of the earlier botanists as a species of the St. John's Wort family—a *Hypericum*—and by others as of the Mallow family—an *Alcea*. In both of these cases the grounds were the supposed union of the stamens. In the old Linnæan system, plants with the stamens united in one mass would have to go to his class Monadelphia, no matter how incongruous the various members of the class might be in other respects. Some botanists fancied they saw this unity in the plant in question, and this brought it into *Alcea*. When the stamens would seem to be in several parcels or sets, a plant would be in the class Polyadelphia, and some fancied they saw this Polyadelphian character here, and then it was referred to *Hypericum*. In the modern system of botany natural resemblances, or a whole set of characters, are taken to form the order. Now the plant is referred to *Ternstræmeriaceæ*, because its general characters agree with the genus *Ternstræmeria*, a somewhat tropical set of plants named in honor of the Swedish naturalist Ternström. This brings it in connection with the Tea plant, and other members of the Camellia family, to which a common observer may trace the relationship. In Linnæus' earlier works, before he suggested the binomial system, he recorded what is now *Gordonia Lasianthus*, as *Hypericum* (*Lasianthus*) *floribus pentaygnis*," and Catesby, in his History of Carolina, recorded it as "*Alcea floridana quinquecapsularis*." John Ellis proposed the new name, *Gordonia*.

EXPLANATION OF THE PLATE.—1. Flowering branch taken in September. 2. Seed vessels, maturing at the same time from the flowers of the year before.

WILD FLOWERS AND NATURE.

INDIAN SUMMER.

There is a beautiful spirit breathing now
Its mellowed richness on the clustered trees,
And from a beaker full of richest dyes,
Pouring new glory on the autumn woods,
And dipping in warm light the pillared clouds,
Morn on the mountain, like a summer bird,
Lifts up her purple wing, and in the vales
The gentle wind a sweet and passionate wooer,
Kisses the blushing leaf, and stirs up life
Within the solemn woods of ash deep crimsoned,
And silvery beech, and maple yellow-leaved,
Where autumn, like a faint old man, sits down
By the wayside aweary. —LONGFELLOW.

THE BONNIE BROOM—A PLANT OF BEAUTY AND FAME.—The following is contributed by William T. Harding, of Mount Holly, N. J.:

It has frequently been remarked that one of the most familiar and beautiful objects to be seen in rural England, and still more in Scotland, is the common broom bush—*Genista scoparia*—when in full bloom. Its thousands of golden flowers make a delightful show, as they gleam like so many butterflies with expanded wings settling on its slender summer boughs. And these same silky blossoms give out a delicious perfume, which generally proclaims the presence of the plant long before it becomes visible.

In "the land o'cakes," where it is exceedingly abundant, it seems to be held in as much esteem—both by Highlanders and Lowlanders, as is the lovely heather bell, which densely spreads o'er banks and braes in many a romantic spot. And in order to give a better idea of its wild or indigenous habits, an indicative quotation is here presented:

"The moorcock springs
On whirring wings,
Amid the blooming heather."

Both on mountain and moorland in Great Britain the comely and modest green broom has had "a local habitation and a name," from time immemorial; and where, apparently, it will still continue to flourish as long as destructive man permits it to remain.

It is mostly seen (as is the case with its native companion—the whin, or furze,—*Ulex Europæus*) growing in inaccessible spots, or where the uninviting soil is too shallow to tempt the enterprising husbandman to disturb its unbroken surface. On that account it is likely it will ever retain its olden tenure there. And, while thus unmolested, will no doubt continue to spread its retentive roots in the soil of "the fast-anchored isle," where for thousands of years before the ruthless foot of the invading Dane, Celt, Norseman, Scandinavian, Roman or Norman had pressed its green turf, it annually blossomed and mingled its fragrance with the hawthorn and rose.

Undoubtedly, the broom was far more abundant in Great Britain formerly—before many of the moors and commons were enclosed, and made into arable farms, than it is at the present time. And, in the long ago, it seems to have given its name to many places which are still retained, such for instance as Broomsgrove, Bromly, Broomhill, Bromielaw, and probably Brompton. As it requires but little moisture, and grows freely in undulating lands, it has been largely planted in Flanders, in order to improve the sandy soils there and hold them well together by its roots. And as its slender, tough, and elastic growth renders it capable of being easily made into sweeping brooms, and for which purpose it has long been used, its appropriate name appears to have been derived from that useful implement.

As floral emblems significant of past events, or pleasant reminders of places, circumstances or persons have often been adopted by prominent characters in history. The plant under notice has long been famous on that account. Its renown chiefly rests upon the legend of having given its old name, *Planta Genista* (Celtic *gen* and French *genet*), to a long race of English kings; and it became the badge of the proud and lofty Plantagenet, Geoffry, Earl of Anjou, who married Matilda, daughter of Henry I, and became the father of Henry II, who was in the habit of wearing a sprig of this plant in his cap; or as the old chronicler

quaintly remarks—"He commonly wore a broom in his bonnet."

According to tradition, "The Earl, when encamped upon a heath just before a battle, plucked a golden spray and placed it in his helmet. The flower gleamed everywhere amid the swaying storm of battle, and the triumphant victor adopted this chance badge as his device." Not only did this nobleman adopt his country's most beauteous wild flower as a cognizance, but he also took its name of Plantagenet, or *Planta genista*, and transmitted the name to his princely descendants, who each bore it from the time of his son Henry II, the first Plantagenet King, called by historians "The Royal Sprig of Genesta," to the tyrant "Hunch-backed Richard," last degenerate scion of the house of Anjou. Referring to this circumstance, a poet has thus addressed the plant :—

"Time was when thy golden chain of flowers
Was linked the warrior's brow to bind;
When reared in the shelter of royal bowers,
Thy wreath with kingly coronal twined.

"The chieftain who bore thee high in his crest
And bequeathed to his race thy simple name,
Long ages past has sunk to his rest,
And only survives in the rolls of fame.

"Though a feeble thing that nature forms,
A frail and perishing flower art thou;
Yet the race has survived a thousand storms,
That have made the monarch warrior bow.

"The storied urn may be crumbled to dust,
And time may the marble bust deface;
But thou wilt be faithful and firm to thy trust,
The memorial flower of a princely race."

The many intelligent readers of this chapter will of course remember the historical account of the sanguinary "*Wars of the Roses*," waged between the rival houses of York and Lancaster, "which had for more than thirty years deluged the land with human blood and watered it with tears." And, as was the case with the Earl of Anjou, wearing a sprig of broom in his helmet, the "*Red Rose*" was chosen as the device of the house of John of Gaunt, Duke of Lancaster, the fourth son of Edward III, while Edmund, Duke of York, assumed the "*White Rose*" as a distinguishing insignia.

To Shakespeare we are mainly indebted for the account of the assumption of the red and white roses by the belligerent followers of the aspiring factions of the house of York and Lancaster, from a quarrel in the Temple Gardens, between Richard Plantagenet, Duke of York, and the Earl of Somerset—the partisan of Henry of Lancaster. Finding that their voices were getting too loud, Plantagenet proposes that they shall

"In dumb significance proclaim their thoughts,"
adding,—

"Let him who is a true born gentleman
And stand upon the honor of his birth,
If he supposes I have pleaded truth,
From off this briar pluck a white rose with me."

To which Somerset replies,—

"Let him who is no coward, nor no flatterer,
But dare maintain the party of the truth,
Pluck a red rose from off this thorn with me."

Their respective followers gathered the different colored roses, and hence, tradition says, these flowers were adopted as badges by the houses of York and Lancaster during the civil wars which followed.

The wearing of crests and badges, by our pugnaciously inclined ancestors, may be traced to a very early period of their history, and seems to have continued until about the time of Queen Elizabeth, when they appear to have lost most of their former popularity. Yet, in Scotland, the custom seems to have lingered longer as a distinguishing badge among the various clans, where some thirty distinct species of plants represented as many different clans.

The badge of "Good Queen Bess" was a Tudor Rose, with the motto, *Rosa Sine Spina*, or a *Rose without a Thorn;* while the grouping of the Rose, Shamrock, Thistle and Princes Feathers still retain their old-time significance in this our day and generation on the British escutcheon.

The discerning readers, I opine, will not have forgotten Sir Walter Scott's allusion in "The Abbot," to the Holly twig which Julian Avenal wore in his helmet when slain, and by which he was recognized as he lay dead in his complete panoply of steel.

After the revolution of 1638, the *White Rose* was adopted by the Jacobites as their badges of the exiled house of Stuart, and the 10th of June was for a long time *White Rose Day*, that being the birthday of the Pretender, as the son of James II was called.

After thus briefly reviewing a few other interesting floral badges our forefathers so proudly wore in the belligerent times now happily long passed, I will now return to the favorite golden flower, which in many instances

seems to have completely charmed its æsthetic admirers with its simple, though exquisite beauty, and which is so pleasingly expressed in the following sentimental stanzas. "The bonnie broom," so familiar to Mary Howitt in her youthful days—and the fond remembrance of which so forcibly reminded her of happier times, is thus pathetically alluded to :—

"Oh the broom, the bonnie, bonnie broom,
On my native hills it grows;
I had rather see the bonnie, bonnie broom,
Than the rarest flower that blows.
Oh the yellow broom is blossoming
In my own dear countrie;
I never thought so small a thing
As a flower my nerveless heart could wring
Or have drawn a tear from me.

"It 'minds me of my native hills
Clad in the heath and fern,
Of the green strath and the flowery brae,
Of the glen and rocky burn;
It 'minds me of dearer things than these,
Of humble faith and bended knees,
Of home joys gone and Memories
Like sere leaves left behind."

Retrospective views of what has been, may, in some measure or degree, be pleasing, even though they may sometimes be slightly tinged with melancholy—as are many of the concerns of life. Yet, the earlier associations, which the remembrance of the "long yellow broom" awakens in slumbering memory, when, in after years, and far away they are transiently revived again, seem to reappear with all the vivid freshness of the past. And, to the sensitive mind of the poet, they seem to have strongly appealed, especially when closely followed by misfortune, and while distracted with care he recalls the peaceful occupations of his earlier days, and the rural scenes which then surrounded him, and with saddened or regretful feelings pens these lines :

"More pleasing far is Cowden Knowes,
My peaceful happy home,
Where I was wont to milk my yowes
At e'en among the broom."

In his novel of "Alton Lock," Charles Kingsley makes old Sandy Mackay exclaim within a few minutes of his death :

"Oh! the broom the bonnie yellow broom,
The broom of the Cowden Knowes."

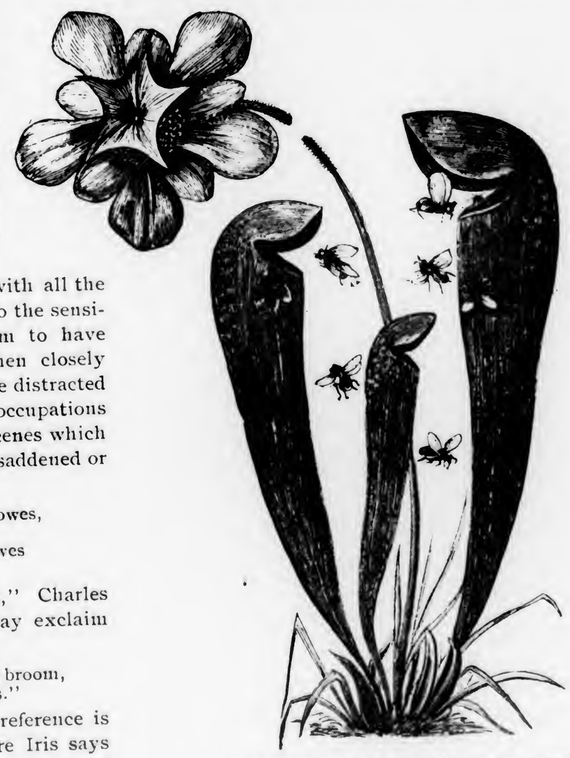
In Shakespeare's "Tempest," reference is thus made to the broom plant where Iris says to Ceres: "And thy broom proved whose shadow the dismissed bachelor loves, being lass-lorn."

And poor Burns, whose love for Nature was ever intensely strong, thus expresses his love for the bonnie broom :

"Those groves of sweet myrtle, let foreign lands reckon,
Whose bright beaming summers exalt the perfume,
Far dearer to me yon lone glen of green brechen,
With the burn stealing under the long yellow broom.

Far dearer to me are yon humble broom bowers
Where the blue-bell and gowan lurk lowly unseen,
For there lightly tripping among the wild flowers,
A listening the linnet, oft wanders my Jean."

We have now, figuratively, been wandering among the "bonnie broom"—inhaling its perfume, and admiring its flowers—for some length of time, and while so doing have said much in praise of the humble little shrub I have endeavored to interest all good folk in, through the aid of poetry, history, narrative



SARRACENIA VARIOLARIS --SEE PAGE 206

and legend. And, although these desultory remarks may perchance seem to occupy more valuable space than the subject may possibly deserve, yet the seductive theme which has so pleasantly beguiled the enthusiastic scribe, who thus ventures to give expression to his thoughts, will, it is hoped, be accepted as a sufficient apology for trespassing so long upon time and patience.

In conclusion, it now only remains for the writer to courteously say there is, at the present time, a fair specimen of such a plant, or shrub, as he has been describing, in full bloom, at 34 Union Street, Mount Holly, New Jersey, and where it will be kindly pointed out, to any one who delights in such pretty things, by the owner.

INSECT CATCHING PLANTS. — A correspondent writing from Bethlehem, New Hampshire, sends a specimen, which we engrave, with the following note: "There came to me in the mail yesterday a curious object which I forward to you, namely, a butterfly entrapped in a flower. I soaked out the dry specimen and found the tongue of the butterfly tightly clasped in the shelly corpusculum of the pollinia of some seemingly Asclepiadaceous plant. The original observer designates the flower by the name of *Cruel Flower*, as it thus entraps butterflies without seeming reason.

I find no description corresponding to it in Gray and conclude it must be an importation from the tropics or from a region where there are large strong insects able to grapple with such resistances as the heavy and tightly fixed pollen masses offer."

It is a Peruvian plant which, to-day, is known as *Aurajia sericifera*. For twenty years after its introduction to cultivation it was known as *Physianthus albens*. Dr. Lindley

CRUEL FLOWER.

gave it to us as *Schubertia graveolens*. We florists had scarcely changed all our catalogues to suit before it was found we must drop *Schubertia* and again go back to *Physianthus*. Our catalogues were scarcely distributed before some musty volume turned up, and it was discovered that *Aurajia* was given to the plant in 1818, while *Physianthus* was not born till 1824. Under botanical rules, that the oldest published name must prevail, we must call the plant *Aurajia sericifera* until some other pamphlet turns up with a prior date. Botanists, under the rule of priority they have adopted, can do no less than stick to it,—but we flower-lovers ought to have some consideration in these matters. Because some lazy botanist did not examine the records as he should have done, the whole world of flower-lovers have to suffer by these changes of name.

Thus the botanists have made it a very cruel plant to the makers of garden catalogues,—but priority rules have no mercy for them.

Its insect catching proclivities are, however, well known, and a wide-awake florist made much money by the tact of giving it the "cruel" name.

But we need not go to the barbarian flora of Peru for instances of vicious behaviour. Our common Dogs'-bane, *Apocynum androsmæfolium*, exhibits the same blood-thirsty proclivities. Scores of innocent little creatures may be seen at times hanging from the flowers as the poor butterfly in the picture hangs.

Our good correspondent seems tainted with the prevailing sophistry that the visits of insects to flowers are for the flower's special benefit. If he will shut up the books written by sensational writers, and take a look for himself at the world of flowers, he will find those that depend on insects for pollination make very poor headway in the world. None of them are annuals. They dare not move away from the territory of their special insect agent,—and only for being perennials, would soon be swept from the earth.

The whole subject of the relation between insects and flowers seems to have had but one-sided treatment. How plants and animals live and behave has been well considered, but little has been said of how they die. One must be as providential as the other. Nature has decreed that every individual must die, and has arranged various methods by which this decree

shall be enforced. We are reminded of what has been written about insectivorous plants by a cut in *Gardening Illustrated*, which came to hand while penning these lines, and which is reproduced here. It was thought the leaves were arranged as pitchers for no other purpose than catching and feeding on insects. It is found that the Sarracenias, or pitcher plants, thrive just as well when insects are prevented from entering the pitchers. If we admit, as we must, that nature has planned all living things so as to be of service to others as well as themselves, and that death as well as life is an evidence of providential benevolence in the line of good to the greatest number, we need not assume utter selfishness as the origin of the pitcher-like form, or of any plant behavior.

TRANSFORMED SEXES IN A CHESTNUT TREE.—I send to MEEHANS' MONTHLY some burs of a chestnut tree at Pitman Grove, N. J. We thought you might be interested.

The tree was very heavily loaded with blossoms, as it is with burs. The burs all grow in clusters. The tips sent are characteristic of the whole tree.

I left the grove two weeks ago, and had these specimens forwarded to me.

I thought at first it might be a reversion to the original type, or, as I was told, a foreign variety.

The tree grows on the edge of the grove with other chestnuts and oaks, and is probably 25 years old.

Professor Apgar informs me it is our ordinary chestnut "so changed that the staminate catkins have become pistillate, and so produce chestnuts."

I send him to-day also a better specimen. I think he was under the impression that only a few, and not all, the burs grew in clusters, when I wrote him a few weeks ago.

G. BUCKWALTER.

Camden, New Jersey.

As Professor Apgar reported, it is a case in which what are normally male flowers have been transformed. The late Isaac C. Martindale exhibited specimens similar, probably from the same tree, some years ago.

The change of sexual characters in flowers is not uncommon. The disk flowers of the dahlia are bi-sexual, but when the tubular flowers become strap-shaped,—that is, form "double"-dahlias,—the stamens disappear, and the florets are wholly pistillate. Female flowers are occasionally noted in the aments or catkins of male flowers in willows and poplars. But the Indian corn is the most familiar illustration. It is not unusual to find the female, or ear-producing spike, with male flowers at the apex; or the "tassel" or panicle of male flowers with grains of corn here and there. It is not usual to see these changes in the chestnut, though it is reasonable to look for them, since we now know the laws which regulate the sexes of flowers. These laws were demonstrated many years ago in a paper published in full in the proceedings of the American Association for the Advancement of Science, Salem meeting, by Mr. Thomas Meehan, and since adopted by most biologists, as noted in "Encyclopædia Britannica," though the strongest facts in support of the principle are not given there.

At the period of fertilization, the primary cell or nucleus is prepared to be of either sex. The final decision is dependent on nutrition. If abundant nutrition is at hand, or the primary cell itself with a high grade of vital power to avail itself of nutrition, the development of the cell is in the female line. With limited nutrition, or a lower degree of vital power in the primary cell to avail itself of it, the development is in the male line.

In trees, some whole branches may have a low vital power, when male flowers result, as in pine and spruce trees,—the stronger branches producing cones. In annuals, the whole plant will often have its vital powers lowered by limited food, either by poor ground or crowding, when nothing but male flowers are produced. The *Ambrosia*, or ragweed, hemp, spinach, etc., are familiar illustrations.

This chestnut here figured is another illustration of this law. The extra thickness of the stalk or rachis to which the chestnuts are attached shows how much stronger the organizing power of the plant is, at this point, over its condition in the normal state of male-flower inflorescence.

We may say that an unusual power in the primary flower cell to avail itself of nutrition resulted in female instead of the usual male flowers. Just to hand are specimens, from Mr. C. F. Saunders, of *Actinomeris squarrosa* with disk flowers wholly pistillate.

VITALITY OF FOREST TREES.—In the August number of MEEHANS' MONTHLY, on page 146, is an article by Mrs. Frederick C. Johnston, from Crete, Illinois, on *Injury by Loss of Leaves*.

She says: "On our farm, in Adams County, Nebraska, May 22, 1893, a hail and wind storm took every leaf from the trees in our orchard; many were in bloom, but after the storm the trees were as bare as in winter.

They leaved out again, and the middle of June another storm left them leafless.

We feared the trees would die this time, but they again sent out their green robes, seemingly bound not to give up to the elements, and by July 9th they were in full leaf again, when the third hail storm not only took leaves but small branches, and tore the bark in strips on the side towards the storm.

After this over half of the trees died. The others, later varieties, still clung to life, and a few even blossomed in the autumn, but the succeeding spring nearly all were dead."

Now, let us draw a lesson from this. Nature helps us to many conclusions. Is it not a legitimate conclusion that those trees lost one-third of their vitality by the first storm, another third by the second storm, and the last third by the third storm?

Suppose these three storms covered three years, one storm each year, would the trees have died the same? I answer, *yes*, emphatically, and I appeal to nature for proof.

Some years ago my Sugar Maple orchard, of 350 trees, was alive with apple tree worms, or something similar, which denuded the trees or their leaves. The worms then disappeared and the trees leaved out again.

Question: Was one-third of the tree's vitality gone or exhausted?

Let *nature* answer the question.

The next year these same trees lost their leaves in the same way and leaved out again.

The third year the worms appeared again, but died without doing any harm. The result was that 50 of the trees died, and dead limbs were seen all over the orchard.

There can be no doubt but what the whole orchard would have died had the trees lost their leaves the third year.

Now, then, is it not conclusive that vitality once lost is never restored?

A plant, a tree, an animal, or a human being, suffers in vitality in proportion to the amount of damage done.

Vitality, in all these, can be exhausted slowly or rapidly.

It has been my opinion for many years that vitality in a human being once lost is never regained, and the results of these two observations seem to confirm me in my conclusion.

Why does a tree die when denuded of its leaves?

The roots of a tree absorb water from the soil and the leaves evaporate the same into the atmosphere, and when there are no leaves to evaporate the roots cease absorbing, and this is a sufficient reason for the death of the tree.

TIMOTHY WHEELER.

Moscow, Vt.

THE PLUCKY BLUE JAY. — My raspberry patch is 50 feet square, surrounded by a wire fence. So many birds make their home in the wooded rooms within ten feet, that it is necessary to protect this patch by netting, which is supported by wires strung overhead. The net hangs over the sides of the fence three or four feet. Occasionally a bird gets inside, especially the Blue Jay. We catch them and let them go unharmed. Yesterday my man and myself were near and saw a Blue Jay in there with a ripe red raspberry in his bill, fluttering against the net. My man went inside and chased him from one side to another three times, and finally got his hands on him at where the fence rail and net met, but the bird managed to slip through his hands and down between the net and the outside of the fence and gained his liberty. All this time he hung on to the berry and flew away with it. That certainly is a good illustration of bird pluck.

W. C. EGAN.

Egandale, Ills.

THE YELLOW GEUM.—We have a number of the yellow *Geum* in our woods,—*Geum album*, Gmelin, and noted as *var. flavum*, in the "Torrey Bulletin" for Jan. 12, 1889. It does not differ from the other except in flowers, though if my memory serves me I found one having a large number, about seven or nine leaflets on the radicals beside the smaller interposed ones. This is not according to the requirements of the species, *G. album*.

E. NEWLIN WILLIAMS.

GENERAL GARDENING.

NOVEMBER.

There is no wind at all to-night
To dash the drops against the pane;
No sound abroad, nor any light,
And sadly falls the autumn rain.

There is no color in the world,
No lovely tint on hill and plain;
The summer's golden sails are furled,
And sadly falls the autumn rain.

The earth lies tacitly beneath,
As it were dead to joy or pain—
It does not move, it does not breathe,
And sadly falls the autumn rain.

And all my heart is patient, too;
I wait till it shall wake again;
The songs of spring shall sound anew,
Though sadly falls the autumn rain.

—CELIA THAXTER.

THE MOON-FLOWER.—The worldly worth of anything is usually measured by the amount of gratification or pleasure it may afford. Reasoning thus, the garden-lover will find it worth his while to hunt a place to put a root or two of *IpomœaBona-nox*, the well-known Moon-flower, next spring. It is only an annual; but a plant raised from a cutting during the winter afforded a great deal of pleasure to the writer in its situation on an arbor. The rapidity of its growth enables it to soon cover a small arbor. Its large, clear white flowers stand out from the background of broad, green leaves making it visible even in the darkness of night, at which time the flowers are open. It is interesting to compare the times of opening and closing. The closing hours are from 7 to 8 A. M., and the opening about 7 to 8 P. M., the times apparently depending on atmospheric conditions. After the cool fall weather sets in, the time of blooming is irregular. The plant above mentioned omitted to bloom one night, and several days after the flowers might be seen during the day, and since at all times.

On two vines, one hundred of the immense flowers were recently counted,—and this amount is not a limit. Its great blooming ability is the more pronounced when we learn the life of a flower is but the one night, and a fresh set of flowers is produced continuously day after day.

The climbing is accomplished by the twining of the young shoots. A wire or stout string support, with a few wooden strips to bear the weight is alone necessary.

SUCCESSFUL CHRYSANTHEMUM CULTURE.—Mrs. B. P. Cheney, of South Natick, Mass., is noted for the successful culture of chrysanthemums on her grounds, under the management of Gardener John Barr. He has had 700 flowers on a plant trained on a single stem. Last year there were 120 varieties in the collection. A committee of the Massachusetts Horticultural Society says of them:

"Mr. Barr considers that quite a number of the Japanese are not worth growing except as exhibition blooms; 500 were grown in boxes on account of the convenience of handling them, it being an easy and quick way of filling up the house, and as they are done flowering they can be cleaned out gradually and the space used for other purposes. The results of this mode of cultivation were quite as satisfactory as growing them on benches. For fertilizing, clay and sheep manure were used. Thirty plants, mostly Japanese varieties, were growing in twelve-inch pots. Those growing in boxes were particularly noticeable, and that mode of cultivation—new to at least a portion of your Committee—it seems to them might be adopted by many growers as an easy way of giving a place to this popular flower."

CRIMSON RAMBLER ROSE.—The *Lyon-Horticole* writes of an exhibition in France of which one whole tent was filled with Turner's Crimson Rambler Rose. They were artistically arranged. The effect, says our contemporary, was "*réllement admirable.*"

This truly beautiful climber appears to receive a welcome in all quarters,—and not without reason. Although introduced but recently, it has been broadly disseminated, which serves to show the extent of its popularity.

CARNATION CULTURE.—A committee of the Massachusetts Horticultural Society visited the famous carnation house of Mr. William Nicholson, at Framingham, Mass., who gave them the following details of his method of culture :

"The cuttings are taken for general stock for winter forcing from February 14th to April 1st ; pricked out in flats, which I prefer to pots ; placed in cold frames about April 20th, and planted out in the field from May to June 10th. I have had splendid plants for fall use struck in April and planted in the field June 10th. I prepare my ground in the following manner :

It is ploughed in the fall, about the middle of November, and left in the rough till spring ; then I put on about once in three or four years eight barrels of lime to the acre, in heaps of say half a bushel. As soon as it is all powder, which will be in about ten days, or earlier if it rains, I spread all over the ground thinly. I put on about one ton of wood ashes to the acre and about five cords of manure, and plow it in about seven inches just before I plant out. I harrow it smoothly and plant the carnations in beds, eighteen inches between the rows and fifteen inches between each plant in the row. Every fourth row I leave two feet, which makes it very handy to take out the weeds in summer. I think that it is owing to the lime and wood ashes that my plants are so free from all kinds of diseases, and that they present a glaucous appearance.

In regard to stopping, one must be governed by the kinds he grows and the time when he wants the flowers for market. Some kinds do not need stopping after July 25th ; others will need it until the last week in August.

The preparation of the loam for benches is as follows : plough up sod ground in the fall ; get a car of good rotted horse manure from horses that are heavily grain fed ; add one horse load of manure to four of loam, and two buckets of pure bone flour without acid ; repeat that till your pile is large enough ; turn two or three times and add two buckets of wood ashes to every five loads (one horse loads). I always have my benches well washed with water and then give them a heavy coat of hot whitewash from fresh lime.

I begin to take in my plants September 1st, and plant in the house about ten by twelve inches apart—a little more or less, according to the size of the plants, and after they are planted in the house syringe once in two weeks with four ounces of salt to three gallons of water, and the alternate week with the following formula : one pound of sulphate of copper in powder, and one quart of concentrated ammonia dissolved together in an earthern jar with water enough added to make three gallons. Keep it all perfectly air tight Take a two-inch potful of this mixture and at the same time half a two-inch potful of clear ammonia and syringe alternate weeks with the salt mixture.

I also mulch my carnations about twice in the season with a light dressing of sheep manure."

INJURY TO TREES FROM ELECTRIC LIGHT.—Seeing that you take an interest in arboriculture, permit me to call attention to the deleterious effect of the electric light on trees. In front of my house, all the trees that are within 50 or 60 feet of the big arc lights lose their leaves and show many dead branches. One tree within 15 feet of one of these lights is nearly stripped to the lowest branches, and is dry and dead (it is a maple). A tall elm about 30 feet away is fast losing the leaves from the long pendant branches—and a Butternut in front of my window is fast going the same way. To test this point I have taken walks of about 20 miles in extent through the city streets with same results visible everywhere, so I am convinced the electric light is hurtful to most trees. They can't sleep with those big glaring electric eyes shining from about 8 P. M. to 3 A. M. or thereabouts. I believe there is also a chemical action from these lights. The tree cannot live in almost eternal day,—they, like human or animal life of any kind, *want rest.* It is only near these lights the decay is so marked. Have any of your correspondents noticed this? I would like to know. Maples, Butternut and elms seem to suffer most. Willows and horse chestnuts do not seem to be effected, nor the lilacs—the Cotton Wood does not seem to feel it all.

Montreal is the best lighted city I have seen on this continent, not excluding New York. The lights are large arc ones and placed about 25 to 30 feet from the ground. Now note this : the trees all begin to lose their leaves on top or on the side facing the lights, and gradually keep losing them downward. Now for a digression, I also believe the electric lights are much to blame for human sight defects, and nervousness, and, lastly, for insomnia. We want darkness for rest, all Nature demands it, and how can people rest comfortable with these high flickering lights glaring in at their windows. You may say close your blinds, but in this climate at this season of the year we have it hot and need our windows open. I am often awakened by a sudden flare and then equally sudden decadence of light. I have no time to go into this phase of the subject, but I am convinced there is much in it.

Another phase of this subject,—I think for forcing vegetables, etc., the light would be useful, properly adjusted. I notice, when exposed to the light, they obtain size, but are weakly.

JOHN HUGH ROSS.

Montreal, Canada.

The subject suggested by Mr. Ross is one of great interest to lovers of trees. Whether or not some darkness is of advantage to trees may be a question. One would think if of value to a maple it should be to a horse chestnut or Cotton Wood. But Mr. Ross's suggestion to have the actual experience of others is better than all reasoning on possibilities. In some cases electric light has been thought beneficial to the growth of plants.

BEGONIA OLBIA.

BEGONIAS AS HOUSE PLANTS.—Few things are found by experience to be better suited to house gardening than Begonias. In their own homes they mostly grow in shady places, free from frost, but not over warm. The engraving represents a very pretty species from Brazil, which has but recently made its appearance, which we have made from a photograph sent to us by Mr. John Coulson, gardener to Hon. Stephen Salisbury, Worcester, Mass.

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Montreal is the best lighted city I have seen on this continent, not excluding New York. The lights are large arc ones and placed about 25 to 30 feet from the ground. Now note this : the trees all begin to lose their leaves on top or on the side facing the lights, and gradually keep losing them downward. Now for a digression, I also believe the electric lights are much to blame for human sight defects, and nervousness, and, lastly, for insomnia. We want darkness for rest, all Nature demands it, and how can people rest comfortable with these high flickering lights glaring in at their windows. You may say close your blinds, but in this climate at this season of the year we have it hot and need our windows open. I am often awakened by a sudden flare and then equally sudden decadence of light. I have no time to go into this phase of the subject, but I am convinced there is much in it.

Another phase of this subject,—I think for forcing vegetables, etc., the light would be useful, properly adjusted. I notice, when exposed to the light, they obtain size, but are weakly.

JOHN HUGH ROSS.

Montreal, Canada.

The subject suggested by Mr. Ross is one of great interest to lovers of trees. Whether or not some darkness is of advantage to trees may be a question. One would think if of value to a maple it should be to a horse chestnut or Cotton Wood. But Mr. Ross's suggestion to have the actual experience of others is better than all reasoning on possibilities. In some cases electric light has been thought beneficial to the growth of plants.

BEGONIA OLBIA.

BEGONIAS AS HOUSE PLANTS.—Few things are found by experience to be better suited to house gardening than Begonias. In their own homes they mostly grow in shady places, free from frost, but not over warm. The engraving represents a very pretty species from Brazil, which has but recently made its appearance, which we have made from a photograph sent to us by Mr. John Coulson, gardener to Hon. Stephen Salisbury, Worcester, Mass.

INTENTIONAL SECOND EXPOSURE

THE WILD GARDEN.—In the April number of the *Gardeners' Monthly* for 1882, there appeared an article upon the "Wild Garden," in which a writer unaware of the existence of an exhaustive and valuable work upon the subject, and believing he had a new idea in garden decoration, contributed to that magazine his experience in growing our common wild flowers. By this paper an attempt was made to direct attention to what was doubtless widely known,—that a large number of our common plants are deserving of a conspicuous place, if not the best place, in our gardens; that many of the most delicate and beautiful flowering plants are to be found among our native hardy plants; and that a wild garden started, at once becomes a permanent fixture, without trouble and without expense. At the present time attention is directed to this same subject by a reference in MEEHANS' MONTHLY, for August, 1896, to Wm. Robinson's book, "The Wild Garden," which reference states there is room for such a work in connection with the wild flowers of America, and what has been done for the British Isles may be done for the wild flowers at home.

The climate of England is practically the climate of the central belt of the United States,—that is to say, the same extremes of heat and cold regulate and control spontaneous vegetation. Plants which are hardy in the central and upper portions of England, will certainly prove hardy in the region extending through Delaware, Pennsylvania, New York, and westward on the same parallels.

The climate of the Isle of Wight agrees more closely with that of the Virginias and Carolinas of the Southern United States, and plants hardy in the one district will most likely prove hardy in the other. Now if this be true, Mr. Robinson's book can be used to advantage in this country, and may serve here every purpose for which it was intended across the sea.

Beyond this, Mr. Robinson has gone so thoroughly into the subject, that without restricting a book to localities, it is difficult to conceive how his work can be improved upon. The wild flowers of the United States and Canada, this author has made liberal use of, and little of value would seem to have escaped him.

We have several valuable books upon our common wild flowers which may readily be adapted for use in connection with the wild garden. Of these books, among the best is a recent one by F. Schuyler Matthews, entitled "Familiar Flowers of Field and Garden."

The writer presumes to forward this communication, because he desires to inform those who take an interest in the wild garden, that we now have ample and adequate information upon the subject, and that a new guide, should it appear, if it be not "local," can hardly be expected to take the place of,—or be an improvement upon, what we already have.

EDWIN C. JELLETT.

CONDITIONS FOR A MARKET GARDEN.—A Birmingham, Ala., correspondent says: "I contemplate entering the fruit and market gardening business near Birmingham, and I would be glad if you would advise me of the best character of land to purchase for fruit culture. There are several different kinds to be had near here, and of course I want to select as desirable a site as possible in order to make a proper beginning.

Is hill or valley more desirable? If hilly, which side is best?"

It is impossible to give an intelligent answer to questions of this character, as local conditions must wholly decide them.

Whether hill side or mere level land should be chosen would depend largely on the direction of prevailing winds, or the character of the soil itself. Much also will depend on just what we desire to grow particularly, and the character of the market where the crops are to be disposed of. The best method of procedure in these cases is to examine personally individual cases, growing on a small scale, and from these observations decide wherein success in a greater effort would probably lie.

BRAKE-FERN AS MANURE.—It has just been discovered in England that the common Brake-fern, *Pteris aquilina*, is remarkably rich in fertilizing elements, and, where it can be used for bedding for horses or cattle, will make manure much more valuable than that obtained from straw. A less bulky fertilizer may be had in Guana, a product of birds. Dovecote sweepings make a good substitute when the other is not easily obtainable.

NEW OR RARE PLANTS.

MARIPOSA LILIES.—The different *Calochortus* species are being improved in the Old World, and the tulip is already almost outnumbered.

STEPHANANDRA FLEXUOSA.—*Stephanandra flexuosa*, of Japanese origin, forms a densely branched shrub with deeply-toothed foliage, of a rich glossygreen, taking on unusual tints of reddish purple in its young growth and again at its autumn ripening. The branches are long and slender, densely clothed with branchlets, and the white flowers, though minute, are borne in such profusion as to give considerable effect. A plant that clothes itself well to the ground even with age,—a feature of itself.

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YELLOW-LEAVED POKE-BERRY.—The *Lyon Horticole* says that M. Treyve-Marie, horticulturist of Moulins, is about to send out *Phytolacca decandra lutea-ola*, a new variety of a plant known as the American Raisin, and the fruit of which is used to falsify wine by giving it an artificial coloring. The new variety has golden spotted leaves like those of the well-known *Aucuba Japonica*; and it stands the sun well, which is not the case with many variegated-leaved plants. It was favorably appreciated at the Paris Horticultural Exhibition last year.

AGAVE VIRGINICA.—I am interested in fragrant flowers, and here is one which is not generally known. It belongs to the Amaryllis family, and is known as *Agave Virginica*, American Aloe or False Aloe. In the woods hereabouts, it is plentiful, and is generally found in rocky places where the soil is dry. It is a hardy perennial with thick fleshy leaves and a fibrous root. Its leaves are always green and it does not die down in the fall. Scape two to five feet high. Flowers greenish-yellow and fragrant. There are two variations of it here in the leaf. One, the leaves are spotted with brown, the other is plain green. The flowers are homely. In bud they resemble the tuberose. It has two points of interest,—one is the evergreen leaves, and the other its perfumed flowers.

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Festus, Jefferson Co., Mo.

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and found perfectly hardy there; and though not showy, as Mr. Steele remarks, were quite welcome on account of their delicious fragrance.

THE HARDY FLOWER GARDEN.

EPIMEDIUMS.—Among good hardy herbaceous plants, few know how to take care of themselves better than species of *Epimedium*, and they are pretty and interesting flowers. Mr. Jacob W. Manning, one of the best authorities on this class of plants, says of them:

"The Epimediums are among my choicest favorites, with their elegant showy foliage, so odd in shape and so handsomely colored in the young growth, and the showy panicles of flowers are note-worthy among spring-blooming perennials; *E. alpinum*, with red and white starry flowers; *E. sulphureum*, pure yellow; *E. niveum*, pure white; and *E. macranthum*, with pale mauve purple Orchid-like flowers, are among the choicest of this genus."

GOLDEN-RODS.—One of the most showy fall flowers is the golden-rod. Without it, our fields for the greater part would appear as forlorn looking as it is possible for them to look. As it is, it completes nature's work of floral succession, with which we are blessed from earliest spring to latest fall.

To the mass of people who are permitted to enjoy a sight of this part of Autumn's glory, as a general thing, every golden-rod is alike, and they know nothing of differences in species. A closer acquaintance with them will reveal much of interest.

Of the species to be found in the vicinity of Philadelphia, probably the most common are *Solidago altissima*, *nemoralis*, *lanceolata*, *Canadensis*, *bicolor* and *cæsia*. They all have distinctive characteristics, and when once distinguished the several species are readily determined. *Canadensis* leads the others in the time of flowering, displaying its large panicles of flowers in early September, then followed by *lanceolata*. These two are easily distinguished as they are very opposite both in leaf and growth. The last named is broad and flat on top, much resembling an inverted cone, and its leaves are extremely narrow or lanceolate. It is also rather dwarf, while *Canadensis*, with its rather coarse, large leaves, holds up its head with the tallest. *Altissima* will probably be confused with *Canadensis* until the student is better acquainted with their differences. The panicle of *altissima* is more loose, and the leaves coarser. Being later in flowering the confusion may be only slight. Probably the most pleasing is *nemoralis*. It is in bloom about the same time as *altissima*, but only equals *lanceolata* in height. Its leaves are rather insignificant, and have a somewhat dusty appearance by which it may usually be distinguished. The profusion and rich color of its blossoms redeem the apparent lack of foliage, and especially when gathered and placed in a vase is the charm of color so appreciable. The growth is of an upright nature, the flowers usually massed on three or four branches (sometimes but one), which have the same upright character, making the color brighter in the mass.

There are other species to be found, but not in such abundance as those already named. Probably the best of these is *cæsia*, a bright yellow species, with bloom extending along dark stems and proceeding from the axils. It is a late bloomer, and, excepting *latifolia*, a large-leaved distinct and uncommon species, and *bicolor*, is the only one of this vicinity with the axillary blooming character.

While the golden-rods are more frequently noticed in dry fields and waysides, yet they like a good, rich, somewhat moist soil, and when so situated will thrive and produce a stronger growth than is customary.

The remaining species of the list named is the most surprising. It might be termed the "white sheep" of the golden-rod family. The ordinary passerby would see or pluck the spike of white flowers without dreaming that he beheld a golden-rod,—*Solidago bicolor*. There is nothing striking in its character other than its having deviated from the color for which the family is indebted for its name. It is, in growth, about two feet in height, and is an inhabitant chiefly of the woods. It is of necessity a welcome addition to a collection of Solidagos.

Golden-rods are easily transplanted, and might be used in our hardy borders, more than they now are, with great effect. A proper arrangement, considering height and period of blooming, will give pleasure equal to many others less common,—especially when massed.

FRUITS AND VEGETABLES.

CIDER.—French agricultural journals are full of accounts of careful experiments, which show that good cider is much more beneficial in diseases of the stomach than heretofore credited.

AMERICAN VARIETIES OF EARLY PEACHES.—American early peaches are very popular in the Old World,—in France especially. The Alexander is placed at the top of the list; while in England, where peaches are trained on the south side of walls, so as to get the full benefit of the summer suns, and are grown to a considerable extent in this way, the Amsden's June, the Hale's Early and the Waterloo, in addition to the Alexander, are very popular. In that part of the world, with all the encouragement the south walls can give them, they are not fit for gathering usually until the first of August. Peaches are grown to a very large extent under glass in England, and so successfully that they may be obtained in the markets from the middle of April to November.

SPINACH.—A cool-climate vegetable, much appreciated in amateur gardening, is spinach. It loves a very rich soil, and should be sown about the end of August or September. If a light covering of rye straw be thrown over the bed when frost comes, a cutting can be had far into the winter season.

RASPBERRY, SUPERLATIVE.—The Superlative is the name of a new European variety of raspberry which has just been advertised by American nurserymen. It is a large red raspberry, more conical in form than the famous Hornet, of the olden times, which held a worthy place on the list of good kinds for a long time. Messrs. Ellwanger and Barry, Rochester, New York, are the introducers.

CLAPP'S FAVORITE PEAR.—Mr. E. W. Lincoln, the highly esteemed Secretary of the Worcester Co. (Mass.) Hort. Society, says of the Clapp's Favorite Pear. "The sole claim to notice was ever and only that its trumpet was blown from Boston, whose geese are invariably swans."

Mr. Lincoln undoubtedly never ate some Germantown fruit that is properly handled, or he would surely reverse his opinion.

NEW BLACK GRAPE, CAMPBELL'S EARLY.—This promising new black grape originated with Mr. Geo. W. Campbell, the veteran grape culturist of Ohio.

Mr. Campbell, recognizing the defects in the popular Concord, determined to produce a variety that would embrace all of the good points of this sort with none of its defects. Campbell's Early is not a chance seedling, but the result of carefully conducted experiments covering a period of many years. It is a very strong, vigorous, hardy vine, with thick, healthy, mildew-resisting foliage, and perfect self-fertilizing blossoms, always setting its fruit well and bearing abundantly. The berries are large, nearly round, often an inch or more in diameter; skin thin; flesh rather firm, but tender and of equal consistency, parting easily from its few and small seeds. Flavor rich, sweet, slightly vinous. It has been highly praised by many of the most noted horticulturists in this country. Mr. Campbell has placed the introduction of this grape with Mr. Geo. S. Josselyn, Fredonia, N. Y., who will also be remembered as being the introducer of the Fay's Prolific Currant,—a variety that is yet the best of its color.

EARLY RIPENING OF CHERRIES.—In the Eastern States we have a May Duke cherry, and yet it is extremely rare that any cherry is ripe in May. In California, however, cherries are seen in the markets early in April. We may judge from this that the fruit season is about a month earlier there than in the East.

It may be remarked that the word May Duke, as applied to the cherry, is simply a corruption of the French word Madoc, which is the name of a district in France where this variety of cherry first originated.

MUSHROOM GROWING.—In the Old World where mushroom growing is one of the fine arts the greatest care seems to be given to prepare the manure that it will not ferment too rapidly. For this reason strong manure is rejected, and that which is secured, being chiefly of horse droppings, is frequently turned over, so that it may lose much of its ardent character before using. More failures come from the burning out of the spawn from excessive heat in the manure than from any other cause.

THE CROSBY PEACH.—Mr. W. D. Hinds, a very successful fruit grower of Townsend, Mass., gives the Crosby Peach high praise. It is one of the best behaved and profitable within his experience in that section of our country.

APPLES AND PEARS ON THE SAME BRANCH.—Mr. Timothy Wheeler, Moscow, Vt., sends the following especially interesting note. We are under great obligations to the *Farm and Fireside* for the use of the cut which illustrated the article originally.

"I send the inclosed puzzle, thinking that you would be glad to receive it, provided you have not seen it. This freak in Nature is giving me some study.

"How was the *apple* and *pear* fed,—built up? How conveyed to those two fruits? Where prepared? Did the leaves know that they must prepare food for a *pear?*

"I regard this case as a confirmation of the view I hold as to *how* wood and fruits are built up."

A POMOLOGICAL PUZZLE.

'The accompanying cut is an accurate reproduction from nature. From the terminal fruit-bud of an apple-twig are growing an apple and a pear, or what would be called a pear from its appearance. This rare specimen was found recently by some boys when picking apples from a tree on a residence lot in Springfield, Ohio, occupied by Mr. M. Goodfellow. The specimen is genuine. The pear-shaped fruit is not, as the writer first suspected when it was brought to the office, the result of skilful work in budding or grafting.

After the specimen was photographed, the fruits were examined. The apple was a ripe Early Strawberry apple of normal size, shape, color and flavor. The pear-shaped fruit was different in nearly every particular from its apple twin ; neither was it a true pear. It had the odor of an apple, but tasted like a combination of apple and pear, both flavors being unmistakable. The core was not in normal position, being quite near the blossom-end ; it was imperfect, and contained but one seed, and that was degenerate.

About sixty feet from the apple-tree on which this curious fruit was found is a late pear tree, bearing fruit of the same form and general appearance. Beyond a reasonable doubt this fruit was the result of cross-pollination of the pear on the apple. Ripe pollen from a pear blossom fell on the apple-blossom just at the right time for fertilization, and a fruit that is a modified apple and pear was the result.

Wonders never appear singly. While the accompanying cut was being prepared, Mr. John H. Gower, living six miles east of Springfield, brought to the office a small limb from a Summer Queen apple tree, bearing in a single cluster two apples and three pears. In this specimen the two apples are small, but otherwise normal. The three modified fruits are entirely different from the apples in size, form and general appearance, and resemble the Flemish Beauty pear. One was small and imperfect. The largest and finest was coreless. The other contained one seed. This seed seems to be perfect, and an attempt will be made to propagate from it an apple-pear hybrid.

We do not know whether there are similar instances on record or not ; but these two specimens make a valuable addition to present knowledge regarding cross-pollination. Their occurrence this year may be accounted for by the marked peculiarities of the season, which changed suddenly from winter to summer. There was no spring weather here. Fruit trees burst into bloom all at once, and remained in bloom but a few days. The pear and the apple bloomed at the same date. To the best of our recollection the weather then was warm and dry. In fact, unusual natural conditions made it possible for the apple and the pear to mix in the bloom. After thorough investigation we have no hesitation in saying that cross-pollination is the solution of this pomological puzzle.'

Facts, similar to these now brought forward, have been frequently recorded,—but possibly no one case has ever been as intelligently studied, and the facts so carefully noted as in this instance. Many years ago, a pear was sent to the late Dr. Jos. Leidy, with an apple growing on the spur with the pear. The pear was of some variety that has woody tissue in the fruit,—a "gritty pear," this kind is usually termed. But the "apple" had the same characteristics. It was truly a pear except in the apple-like form. A note of this appears somewhere in the "Proceedings of the Academy of Natural Sciences of Philadelphia."

In the case now before us, there was a greater departure. Besides the pear form, the core was where a pear core should be, and there was somewhat of the pear flavor. These facts are of unusual interest.

The occurrence is referable to what is now known as evolution. The growth force of plants is rhythmic, and these rhythms vary in their energy. With this variation the form varies, and, further, with the variation in form there is a variation in the chemical constituents. A pear is really a modified branch,—a branch which has become succulent and juicy at the end. Greater energy is expended in lengthening the branch in the case of the pear than in the apple,—or, to put it another way, the tendency to succulency in the pear begins at an earlier stage than in the apple. This results in having the core much above the base of the fruit. As to change of chemical character with change of form this was demonstrated many years ago by the late Dr. Sterry Hunt. The common American Arbor-vitæ often retains its early Heath-leaved character for some years. The chemical characters are strikingly different from those which appear when the arbor-vitæ assumes the common form in which we usually see it.

Pollination will not effect such changes. This has been determined over and over again. The seed alone is affected by cross pollination, as we see in Indian corn, and as has been proved in the case of the light and dark stock gilly seed. But this is to be expected, as the seed and seed only is the direct product of pollination.

In regard to Mr. Wheeler's query about food, the leaves do little, if anything, more than supply carbon for building up cell tissue. The chemical combination is the function of the individual cell. If this were not so we could not grow pears on quince trees or apples on thorns.

Evolutionists believe that the apple and pear are derived from some one, not very remote, ancestor,—varying degrees of internal energy, says the senior conductor of MEEHANS' MONTHLY, being responsible for the diversion on distinct lines,—a struggle for life in which the fittest survive, say other classes of evolutionists.

APPLE LIMB BEARING APPLE AND PEAR.

BIOGRAPHY AND LITERATURE.

THE LIFE OF THE ROSE.

Where are voices kings were glad to hear?
Where now the feast, the song, the bayadere?
The end is nothing, and the end is near.

And yonder lovely rose: alas! my dear!
See the November garden, rank and drear;
The end is nothing, and the end is near.

See! how the rain drop mingles with the mere.
Mark! how the age devours each passing year;
The end is nothing, and the end is near.

Forms arise and grow and wane and disappear,
The life allotted thee is now and here;
The end is nothing, and the end is near.

—From the *Persian*.

EUCALYPTUS.—A correspondent, who occasionally sends us criticisms on literary matters, which we always value, refers to the orthography of *Eucalyptus rostrata* and *E. amagdalina*. He suggests that the specific name should be *rostratus* and *amygdalinus*. Another correspondent refers to the same thing, and refers to *Eucalyptus Globulus* as in general use, and must be right. It is pleasant to receive these reminders, for the way to be right in matters of importance is to be careful in the smaller ones. Then the larger ones will take care of themselves.

But the criticism will furnish a lesson to lovers of flowers who do not know the reason for some things. An adjective, in grammar, must agree with the noun in number, gender and case. In Latin the termination usually indicates the gender. Most nouns ending in *us* would be masculine; those ending in *a* would be feminine. *Eucalyptus*, if a male, would require its adjective to be in the same form—*rostratus*, and not *rostrata*. But it so happens that though ending in *us*, *Eucalyptus* is classed as feminine, and, therefore, the feminine *rostrata* is to be used, and not *rostratus*. But how about *Globulus*, which is correct? Our correspondent number two has to put the trouble of deceiving him on those modern reformers, who are dropping all capitals in the spelling of the adjectives, which specific names really are. Linnæus adopted the practice of using capitals for the specific names when it was necessary to indicate that they were derived from proper names, or had been in former use as proper names. He would write *Smithii* and not *smithii*, as some moderns do, so as to indicate that it was named in honor of a Mr. Smith, and not for a blacksmith or some other smith.

In the case of *Eucalyptus Globulus* he would spell the name with a capital, because it is not used as a mere adjective to *Eucalyptus*, but was once a proper name when first employed here by Labillardiere, and not from its seeming mathematical meaning as an adjective term.

Our correspondent could not have struck a better illustration of the weakness of the reform movement in relation to the use of capitals in specific names. Ignorant of its origin and of the gender of *Eucalyptus* the reformer would be at sea.

GOLDIE.—Apropos of the interest which the notices of Mr. John Goldie, in the July and October numbers of MEEHANS' MONTHLY, have brought out, it may be well to call attention to the brief but interesting and accurate account of the life and botanical labors of this pioneer botanist published in the *Botanical Gazette* for October, 1886. The article was written, if I am not mistaken, by Dr. Asa Gray. It will be a service to botanists to have Goldie's journal put into print, which will be much appreciated.

J. C. ARTHUR, Purdue University.
Lafayette, Indiana.

JOHN WRAGG.—One of the original pioneers of intelligent gardening in Iowa has recently passed away in the person of Mr. John Wragg, of Waukee. He was full of years and highly esteemed by all who knew him. He settled in Iowa in 1854, starting from the vicinity of Philadelphia, and few subjects gave him more pleasure than to write about the beautiful rare trees he had left behind him but never forgot. He located at Waukee in 1865.

AN ILLUSTRATED FLORA OF THE NORTHERN UNITED STATES AND CANADA and the British possessions between the Atlantic Ocean and the 102 meridian. By Dr. N. L. Britton and Hon. Addison Brown. Published by Charles Scribner's Sons, New York, Vol I, to be completed in three volumes. It will be no exaggeration to pronounce this the most valuable contribution ever made to American botany, so far as the area covered by Gray's Manual—somewhat extended. Plants vary considerably among themselves. It is rare that a collector can find his plant accord with its description. The more extended the description the worse often for the student, as he finds more differences from the text than in the shorter ones. A wood cut of every described plant, together with the description, as given here, cannot fail to be of immense service. The student will have to remember that the same difficulty will occur with a cut as with the description. It will only give the general character, but the text and a cut together is a double security. Regret will be felt, in many quarters, at the wholesale changes in plant names, under what many regard a strained interpretation of the priority rule. But this matter has been so often discussed, that it need not be reviewed here. Granting this to be unfortunate, the authors deserve the thanks of every botanist for this successful ending of a great task.

THE SOIL.—By F. H. King. Published by McMillan & Co., New York. It is said that it is a sign of a bad workman, when one quarrels with his tools. By the converse, a good workman knows all about his tools. Certainly the most successful cultivator is one who, with good practical experience, knows all about the soil, its nature, relations and fundamental principles of management, which is what Prof. King teaches in this little book. The author is connected with the Agricultural Department of the University of Wisconsin, and is a successful teacher in his line.

GEO. M. BRADT.—Mr. Geo. M. Bradt, the founder of the very successful *Southern Florist and Gardener*, was brought up in Chattanooga, Tennessee. He was the founder of the Chattanooga Floricultural Society, and he has in many ways been connected with the advanced gardening of that section. He is President of the Park Commission of that city, and the first great park there was dedicated on the last holiday of the nation, Mr. Bradt receiving many compliments for his successful work. He is but 31 years of age, and progressive gardening may yet receive many years of success from his intelligence and energy.

THE FLORA OF ALABAMA.—For all his advancing years, the well-known and highly esteemed botanist, Dr. Charles H. Mohr, of Mobile, is as youthfully active as ever. In August he returned from an extensive botanical trip through the southwestern extremities of the Appalachian chain of mountains and has added another interesting plant to the catalogue of the plants of Alabama, in the form of a grape vine, *Vitis palmata*, originally discovered in Missouri by the lynx-eyed Michaux, but still comparatively unknown.

RAYLESS ERIGERON STRIGOSUM. — For several years I have noticed the marked increase of the discoid variety of *Erigeron strigosum*, Muhl., in our fields, and also many gradations. One form with large, fine rays, one with smaller rays, one with depauperate rays or only rudiments. Mr. Ferris Price has noticed the same thing in Delaware Co., Pa. The movement was first noticed in New England, and of late years has grown very marked in this section. Is there a plausible explanation?

E. NEWLIN WILLIAMS.

THE NURSERY BOOK.—By L. H. Bailey. That this book, which was issued as a complete guide to the multiplication of plants, should have sold so well as to call for this, the third edition, is a strong fact in favor of its value, aside from the editorial approval which greeted the first edition. It is published by the McMillan Company, New York.

DR. H. H. RUSBY.—Dr. Rusby has returned from his botanical excursion to the Southern Orinoco, in South America. It has been rich in results, many new species and some new genera are among the discoveries.

NEW WORK ON AMERICAN FERNS.—Mr. Raynal Dodge, of Newburyport, Mass., is preparing a book on the vascular cryptogams of New England.

GENERAL NOTES.

PRONUNCIATION OF VIOLET.—A correspondent of London *Gardeners' Chronicle* says:

"We have hardly got over the discussion which raged so freely respecting the proper pronunciation of the name *Gladiolus*, when another hare is started by a querist who at the recent conference at the Botanic Gardens, Regent's Park, wanted to be informed as to the proper pronunciation of *Viola*. The somewhat affected one getting into common use is Ve-ola, the "i" being pronounced "e," but soft. That is the style of the cult, who always seem to be fond of pronunciations of the mincing order. The querest in question wanted to know if using a plain English accent to *Viola*, we should be right in pronouncing an allied plant ve-olet. Now there are in common use two pronunciations, Vi-o-la and Vio-la, the first syllable short and soft. The first is the old style, the latter, the later common style, whilst the perversion of the "i" into "e" is presumably the new style. If *Viola* is to be regarded as a purely Latin term, then its pronunciation must be governed by its derivation. If on the other hand we regard it as a purely vernacular term, such as violet, pansy, daffodil, etc., then should its pronunciation be governed by custom. That the term is not used in its botanical sense by raisers and growers of *Violas* there can be no doubt, but it is by them regarded entirely as a common and well understood appellation. When, however, at a conference some two or three diverse accentuations are heard, there is wisdom in having the correct one made not only clear, but constantly employed; even the most unlearned does not like to be caught in any *lapsus linguæ*."

This has an interest for Americans, as well as other English speaking people, for an attempt is being made in some of our schools to have Latin spoken, as Italians to-day would speak it. For ages English people have given English pronunciation to the Latin letters, and there is no more reason why we should give the Italians the privilege of exclusively using a dead language. The English language is probably spoken by a greater number of intelligent people under our special form of civilization than any other, and the English method of pronouncing Latin would render it better understood by the majority of men than any Italian pronunciation would. We are glad to see our contemporary standing out for Vi-ola instead of Ve-ola.

VARIETIES OF PEAS.—Very much attention is given to pea growing in vegetable culture in Massachusetts,—and a nice discrimination shown as regards varieties. Mr. C. N. Brackett says in regard to the exhibitions before the Massachusetts Horticultural Society last year:

"Peas were shown for the first time June 15th, F. C. Goddard being the exhibitor. From this date on through the season peas were shown in liberal quantity and variety. The leading kinds were American Wonder, Advancer, Stratagem, Heroine, and Champion. A new and very handsome pea belonging to the same class as the Heroine and Stratagem was shown by Samuel J. Trepess, and was much admired. It was called Juno.

With many growers the Heroine is taking the place of the Stratagem on account of the difficulty of procuring pure seed of that variety, which of late appears to be badly mixed and unreliable. It is to be regretted that so fine a pea should be allowed to run out for want of care in the selection and growing of stock seed."

CIRSIUM DISCOLOR.—Mr. A. Lunzer, who painted the original admirable picture of *Cirsium discolor*, calls attention to an error in the description of the plate. The explanation of Fig. 5 belongs to Fig. 6; Fig. 5 is the outer calyx scale. Mr. Lunzer has our best thanks for pointing out this great blunder.

HISTORIC TREES.—A San Franciscoan is planting trees from battle-fields and historic spots of the Revolution.

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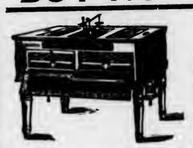

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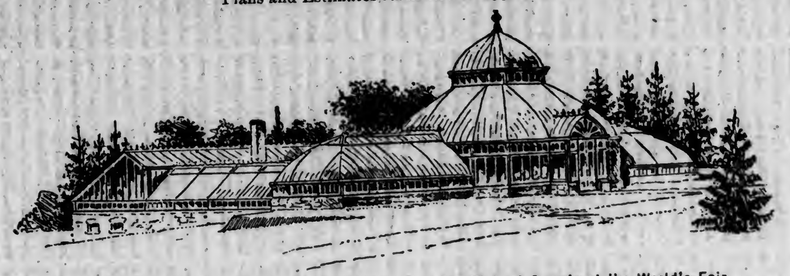

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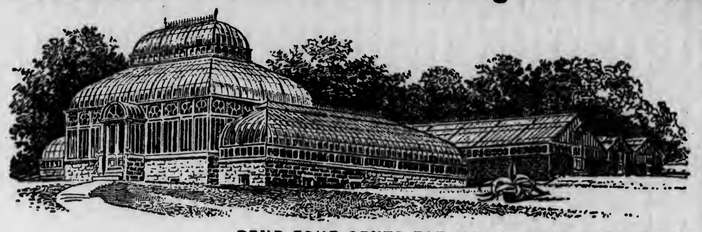

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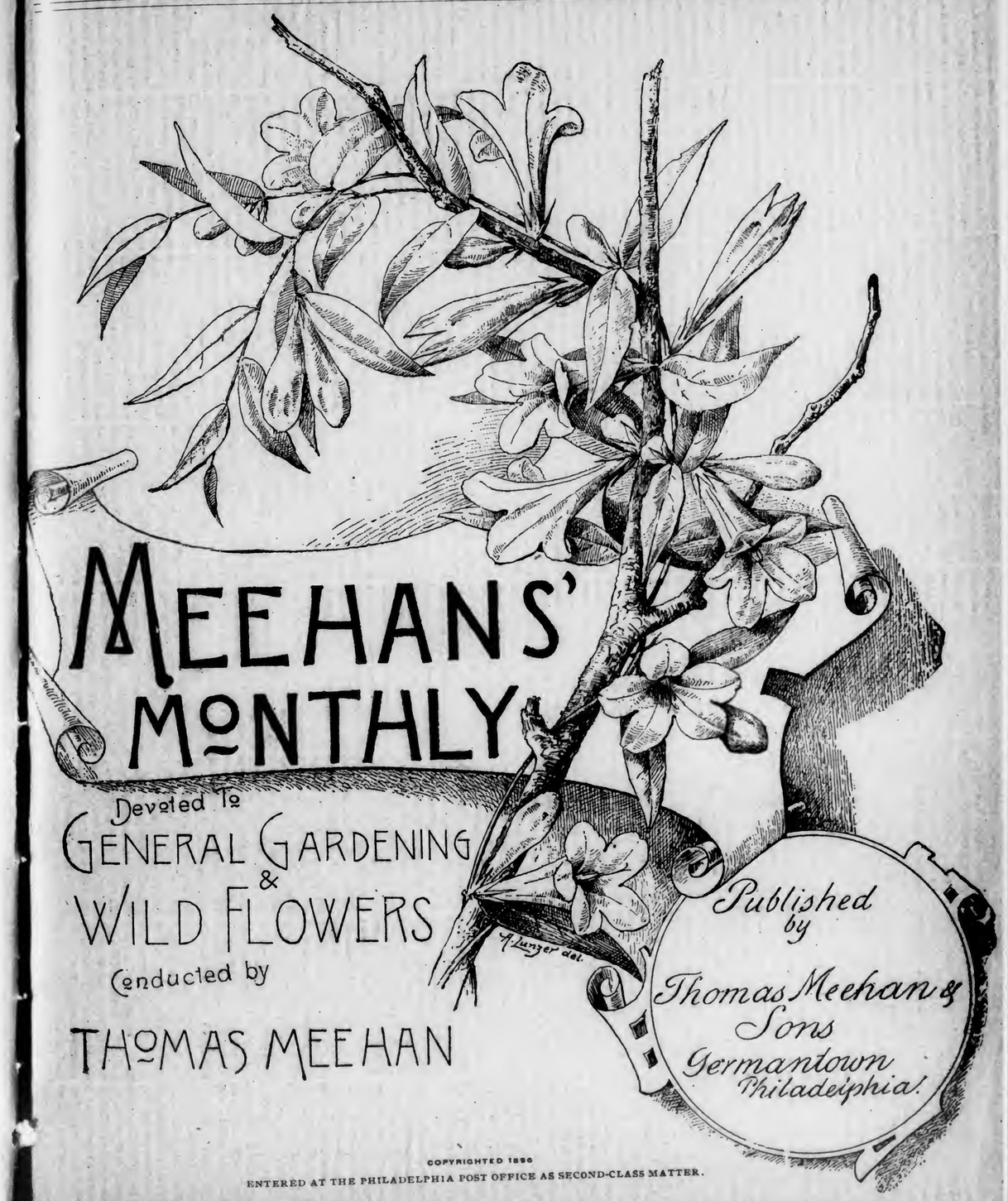

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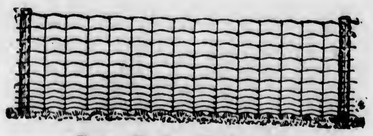

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RUDBECKIA FULGIDA

RUDBECKIA FULGIDA.

SHINING CONE-FLOWER.

NATURAL ORDER, COMPOSITÆ.

RUDBECKIA FULGIDA, AITON.—Hispid or hirsute, a foot or two high; leaves from narrowly to oblong-lanceolate, mostly entire, lowest and radical spatulate-lanceolate and tapering into slender petioles; foliaceous bracts of the involucre often ample and equalling, or sometimes half, the length of the fully 12 to 14 inch-long rays; disck over half an inch in diameter. Gray's *Synoptical Flora of North America*. See also Gray's *Manual of Botany of the Northern United States*, Chapman's *Flora of the Southern United States*, and Wood's *Class-Book of Botany*.

In the "Native Flowers and Ferns of the United States," of which, in so far as these illustrations are concerned, MEEHANS' MONTHLY is a continuation, there is an illustration in the first volume of the second series, No. 14, of what was at that time believed to be *Rudbeckia fulgida*, but which Dr. Asa Gray, in the "Synoptical Flora" above cited, decides should properly have been referred to *Rudbeckia speciosa*. Dr. Gray remarks that this species has been "long cultivated in gardens as *R. fulgida*;" but not only in gardens, but in herbaria has the error existed. The *Rudbeckia fulgida* of Darlington's *Flora Cestrica* clearly relates to *R. speciosa*, as do the descriptions of many of the earlier botanists. Even many eminent botanists of modern times had confused the two species. Dr. Engelmann was among these. When the plant now figured was first brought to him by Mr. Eggert, a notable botanist of St. Louis, so little did he recognize the plant as what he had known as *R. fulgida*, that he determined it to be a new species, and distributed it to his friends under the name of *Rudbeckia Missouriensis*. The drawing given with this chapter was made from Dr. Engelmann's specimens, and inscribed with its new name. He had intended to describe it under this name in a chapter in the "Proceedings of the American Academy of Arts and Sciences" along with *Vernonia Lettermanii* and other plants, but hesitated, fortunately to find that it was the true *Rudbeckia fulgida* of our earlier botanists.

Many will regard this species as one of the most beautiful of the genus. The plant throws out side-branches at the base which, if they were a little more geotropic, would be creeping runners or stolons, much as *R. speciosa* does, and forms a neat compact plant with an abundance of root-leaves. But these leaves are less coarse and harsh than in the former species, while the flowers are of a brighter yellow, the tints of which are better brought out by reason of the darker shade of the disk florets. The flower stems also support themselves easily, and are not liable to fall around as if seeking support. The leaves are paler beneath than other species and might almost have the appellation "discolor," which name is given in Pursh's "Flora," to a form collected in Florida, by Bartram, which, with the upper portion of the ray petals golden yellow, had them deep orange or purple beneath.

It is interesting to note that, while *Rudbeckia speciosa* is found to be at home in meadows and grassy places, the species now illustrated is found naturally in higher situations, generally on rocky hill-sides. Torrey, in his "Compendium of the Flora of North America," notes it as being a native of the "Northern and Middle States," but he, like many of his contemporaries as already referred to, had evidently taken *Rudbeckia speciosa* for it. Its northern range scarcely reaches Pennsylvania. Virginia to Louisiana, Missouri, Louisiana and Texas is the range as given by different authors. Mr. Henry Eggert, of St. Louis, who early called Dr. Engelmann's attention to it, and always considered it the true *Rudbeckia fulgida*, for all the great botanist believed that it was a new species, found it in the glades of rocky hills,—sometimes in such abundance as seemingly to be in possession of the whole ground, presenting a beautiful picture at the end of summer. Mr. Geo. N. Letterman, another botanist residing in the vicinity, who was also prominent in drawing Dr. Engelmann's attention to this plant, writes to the author as finding it in much the same situations as Mr. Eggert. "They abound on the southern slopes of limestone glades—never on

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COLOR PHOTO

the northern slopes or in level woods. They are often found in company with *Kuhnia eupatorioides*, *Liatris cylindracea*, *Œnothera Missouriensis*, *Echinacea angustifolia*, *Cacalia tuberosa*, *Silphium laciniatum* and *Asclepias viridis*. These stony glades are rather wet until the beginning of summer, and usually very dry in July and August."

The common name, "Cone Flower," adopted here, is not the common name, but a botanical effort to start something of the kind, which the common people have not followed. The receptacle in which the florets are borne (Fig. 3) is more conical than in many other genera of compositæ, and this point suggested the name. Common people, when they give plants names, rarely note these nice distinctions. In Pennsylvania, where some of the species trouble the farmer, the name of Golden Daisy is the prevalent common one. This particular species, however, judging from the localities in which it loves to grow, is not likely to be a troublesome one to the cultivator.

Aside from the beauty of the flowers and of the general appearance of the plant, which add to human pleasure, it has not earned for itself a place among those which serve the wants or alleviate the sufferings of mankind,—nor, indeed, has any one of the genus. But a peculiar resin abounds in most of the species which may be found useful when human needs suggest the necessary experiments.

Though the species gathered together under the genus *Rudbeckia* are exclusively American, Linnæus dedicated it to two distinguished botanists of his own time, two Rudbecks,—father and son, who had preceded him as professors in the University of Upsal. The former was the author of a work called *Campi Elysii*,—a work, Linnæus says in one of his letters to Haller, that was so rare that he did not think there were ten copies extant in the whole world. After the younger Rudbeck had succeeded his father in the professorship, Linnæus became his assistant in the botanical department, and continued to aid Prof. Rudbeck for a year in this capacity. This was during the year 1830. Subsequently, when Prof. Rudbeck retired on account of age, Linnæus succeeded him in the position. There seems to have been no reason for attaching the names of these botanists to the genus but a grateful desire to do honor to those who had benefitted alike the science he loved and his own personal veneration for them. Botany, however, knows no country; and, American genus as it is, the tribute done to the memory of men whom Linnæus delighted to honor, will be appreciated everywhere.

Though the genus is not very large in numbers, many attempts have been made to send some of the species to other genera. Among the best known of these are *Echinacea*, *Lepachys*, and *Obeliscaria*. The modern tendency is, however, to broaden the character of a genus, so as to include a number of points, than to add to the lists of names by too closely dividing. Even the species which are now recognized as such, vary so much among themselves that botanists are frequently at a loss to decide to which of the various species anyone in question should be referred; and it is more than likely that in time, when a larger number of specimens from various localities shall have been collected and compared, some of the species now regarded as distinct will be combined as have the several genera. At the present time there are about twenty-five recognized species, but this includes some that would be regarded under the genera of some authors as cited.

Though, as already noted, the chief use of the species of *Rudbeckia* is to ornament the world's surface, and little is known of any special use in the arts that aid human progress, they are invaluable in decorative gardening. They grow and provide for themselves in flower borders much more easily and with less care on the part of the cultivator than many others. When those which require nicer care disappear, the *Rudbeckia* will hold its own, and seems to rather prefer to be let alone. In the gardening of the Old World, they receive a prominent place. Mr. Wm. Robinson, in his "English Flower Garden," gives them much praise. They continue a long time in bloom, and he remarks that in that country, they are singular ornaments from early August till late in October. In our country, they are much valued for cutting for table decoration, for even in water, the flowers remain a long time without withering.

EXPLANATION OF THE PLATE.—1. Root leaves and habit of root growth, from a Missouri specimen. 2 Nearly full length specimens of flower stalks. 3. Section of receptacle showing the conical form.

WILD FLOWERS AND NATURE.

THE LANGUAGE OF NATURE.

To him who in the love of Nature holds
Communion with her visible forms, she speaks
A various language; for his gayer hours,
She has a voice of gladness and a smile,
And eloquence of beauty; and she glides
Into his darker musings, with a mild
And healing sympathy that steals away
Their sharpness ere he is aware. —BRYANT.

HABIT OF THE CUCKOO FLOWER. — Since writing of the Cuckoo Flower (*Cardamine pratensis*), in the October number of the MONTHLY, I find my speculations regarding the dropping of its leaflets verified by a reference to the recently issued "Wayside and Woodland Blossoms," by Edward Step. Here it is stated that each leaflet is capable of sending out roots and forming a plant by itself, just as the Horseradish stems are known to do. It would be curious if these two marsh-inhabiting cresses are found to be the only ones possessing this habit. An examination of our other near plants may reveal others with this strange method of propagation.

WILLARD N. CLUTE.

Binghamton, N. Y.

FERTILE CLOVER — In America, the first crop of clover rarely produces seed. After cutting for hay a second crop of shoots appear, and these seed abundantly. The humble bee is not hatched while the first crop of clover is in flower. Those who see the necessity for insect aid in the pollination of flowers, in almost every case, have always cited this as one of the strongest arguments. It runs thus:—no bees, no clover seed; plenty of bees,—much seed. The other side have contended, that it is vegetative luxuriance, and not the lack of pollination that results in the sterility of the first crop. In support of this they refer to the vigor of young fruit trees, or of all trees for the matter of that. If by some accident a young tree gets injured, and its vegetative vigor checked, it becomes fertile some years before its more lucky fellows.

A remarkable instance of the working of this law on the clover question is given in the *National Stockman*, of August 6th. "M. C. Morris, of Coschocton County, Ohio, [post office address unfortunately omitted] tells of the effect of the extraordinary dry season, so checking the luxuriance of the first crop of clover, that it was as fruitful as any second crop. It was ripe by the 20th of May. Every head was well filled, not a solitary bee had been hatched up to that date."

VITIS INDIVISA. — A correspondent sends a specimen for name with these remarks:

"It has the stem of the Virginia Creeper with somewhat similar fruit and tendrils. It has the leaf of the Frost Grape and the long bunch, but with few berries; colored pink and blue with a bloom. If it is not a cross of these two plants, then what is it?"

The suggestion of this correspondent, that *Vitis indivisa* is a hybrid between a wild grape and the Virginian is just as legitimate as the numerous "undoubted" hybrids recorded in the works of eminent botanical authorities in other cases. Numerous "undoubted" hybrid oaks are in mind while penning these lines, the only ground for this absolute certainty being the "intermediate characters," as in this instance.

A WINTER STROLL IN A FOREST.—Dr. C. C. Abbott, describing a December stroll in a wood near Trenton, advises one to "determine beforehand whither you will ramble, and make an early start. Sunrise I have always associated with mirth, and sunset with melancholy. It is reasonable to do so. Be astir at sunrise then, and receive the greeting of that lover of the dawn, the blackcap. *Chick-a-dee-dee* means 'cheerfulness,' as he who hears it quickly learns, for the chill of the early hour is tempered. Those who never see the world at such a time have strange ideas of winter. Frost is a gardener of most excellent taste, and when he has encased seed pods and dry grass in crystal all their beauty is restored.

CELL STRUCTURE IN WOOD.—How is it formed?

It is generally believed that the necessary elements for the formation of the new cells are taken in by the leaves and so are passed down to all parts of the tree (outside) and assimilated.

Of course they must pass down in the cells of the wood or bark. I have an objection to each of these routes.

If we cut across a tree (when the bark is loose) a few inches, and then up some inches, turning the bark up, and then slip in a plate of some metal, fitting it nicely, draw down the up-lifted bark, securing it from the atmosphere, and then, when the growth of the tree is over for the season, strip up the bark, we shall find the new cells on the *outside* of the plate. So the material for the cells *cannot* come down in the *wood*. And how can the *bark* be the channel when the continuity of the cell-structure is broken by lifting the strip of bark up for the plate?

Nature usually takes the shortest cut and the easiest way in accomplishing her purposes.

If neither of these passages are used for this purpose, then we must look elsewhere for the origin of these cells. There can be only one other explanation.

Shall we not find an answer by comprehending the office of the Medullary rays?

They are radial and connect the centre or heart of trees with the atmosphere by flat, elongated and radial cells.

These cells are for some purpose. Why do not our botanical text books explain the office of the Medullary rays? Is it because they do not know?

I have specimens of maple wood, showing distinctly the rays clear through the inner bark, thus reaching the atmosphere.

Does not this explain the mystery of cell structure? TIMOTHY WHEELER.

Moscow, Vt.

THE NORWAY AND SUGAR MAPLES.—A correspondent observes that very few are able to distinguish between the Norway and Sugar Maples, and that some rules for distinguishing them might be useful to readers of MEEHANS' MONTHLY. Nurserymen readily distinguish them by the Norway Maple having stouter shoots, round blunt buds, and the bark of the older wood veiny. The tree itself is rarely perfectly straight. The flowers are yellow and showy, and there is milk in the leaf-stalk, which flows when broken. The Sugar Maple has slender twigs, long acute buds, bark not veiny, trunk generally straight, and the flowers in pendulous racemes, not particularly showy. There is no milk in the leaf-stalk. The under surface of the Sugar Maple is grey, —almost silvery at times, except in variety *nigrum*, in which the leaves are of the same shade of green on both surfaces. But what the botanists call variety *nigrum*, is just as good a species as numberless other plants which are so regarded, and should always be spoken of as *Acer nigrum*. That *Index Kewensis* and other authorities should make it the equivalent of *Acer saccharinum*, indicates a knowledge of it from herbarium leaves chiefly.

HERBARIUM OF PICTURES. — I send you three pictures of fern fronds which have been printed from nature. Any one making a collection of our native or cultivated ferns will find this a nice way to obtain permanent pictures of each frond gathered. After the collection has reached to a good number of pictures, they can be mounted in a blank book with name and full description of the fern, and any notes that would be interesting about the same. The best way is to paste the picture on one side of the book and write the name, etc., on the other. In this way one will soon get a book of ferns that will be invaluable to the collector. Not only ferns, but, leaves of the different oaks, or in fact any of our forest trees, can be treated in the same way, and I can assure you it is a very interesting study to get up a collection of leaves or ferns in this way. The accompanying pictures are on what photographers call "blue paper" (or Ferro Prussiate), which can be purchased at any dealer in photographers' supplies, and in any sizes, from 3¼ by 4¼ inches, up to 18 by 22 inches. Then you need a printing frame of the size you desire the picture to be. (The printing frame can be purchased at same store as paper.) If one does not wish to go to the expense of a printing frame, two sheets of glass will do as well, only more care is necessary in printing, as in this way the frond is apt to move in handling, which is apt to spoil a picture, therefore I would advise all to get a regular frame, as it will prove more satisfactory in the end, and it is much more easily handled. If the frame is used, a sheet of clear glass to fit the frame is required. Place the glass in the frame, on this lay the subject to be pictured; then the prepared paper, dark side next the leaf. Now place the back in position, and expose to sunlight or strong daylight, and watch the paper through the glass,—very soon it will become of a beautiful blue color, and as soon as you have got the blue shade you desire, remove the print and wash in pure water for about fifteen minutes. Then place between blotters to dry. In this way, one can get a beautiful picture in blue and white, the outline of the frond or leaf being in white, while the surrounding ground is a beautiful shade of intense blue. By watching the printing carefully, one can get any shade desired, from a light blue to a deep dark blue. In this way, we can get up a collection of pictures which can be handled without fear of breaking, which cannot be said of fronds dried and mounted in the ordinary way.

Washington, D. C. P. BISSET.

FERN FROM A "BLUE PRINT" HERBARIUM.

AUTUMN IN NEW HAMPSHIRE.—Mr. Newlin Williams writes : — "The leaves of *Aralia nudicaulis*, in the woods about two weeks ago, were a marvel to behold, seeming to change to all colors indifferently, from pale yellow to deep, rich old gold, and from orange through the reds to maroon, and then, not content with that, some assumed terra cotta and pinkish shades.

The leaves of some of the Red Maples are brighter in the fine sunlight than I ever conceived it possible for Red Maple, or any leaves, to grow. They were a living, fiery crimson.

At Blair, I received the cut of *Ophioglossum* forwarded to me from New Hope. It is good, considering the poor print, but I should have been very glad to have provided a better one. I have found much larger specimens of *Ophioglossum* about Bethlehem than those in my photograph ; also many interesting things quite new to me. Though most of the Bunchberry is in fruit, some few linger in blossom, and, by most fortunate chance, one Gold-thread flower in its prime came to my notice while looking for ferns at an upland woodedge.

I fear to begin on the Flora lest I weary you by my enthusiasm. Whole sloping meadows are green with Sweet Dicksonia, which exhales a most delicious perfume in the noonday sun. The delicate beech-ferns (*Phegopteris Dryopteris* and *P. polypodiodes*) are features of the woods,—co-features with the *Oxalis Acetotella*, dwarf cornel, Hobble-bush and Linnæa on the forest floor, and birches, maples, poplars, firs and Red Spruce above.

I am making my temporary home at an altitude of 2,000 feet, where Rag-weed does not venture. I remark no poison ivy, no May-apple, no *Amphicarpæa*, no *Desmodiums*, no *Aster ericoides*. The asters here are (so far as I am able to judge) *Aster radula* and var. *strictus*, very common, the variety almost covering the ground of Round Mountain and sunny spots on Mt. La Fayette. *Aster longifolius* in the open, and in the wood edges ; *Aster puniceus*,—lower down *Aster Novæ-Angliæ* and others.

Weeds do not flourish. Carrot is absent, Rag-weed none, *Erigeron Canadensis* reduced to a mere pauper sprig a few inches high,—*Achillea* in the same state. No daisy,—a few harmless, rather pretty, *Erigeron strigosus*,—very large and handsome tall buttercups. Actually *Elecampane* escaped, and blooming orpine, the two species of *Galeopsis*, clovers, and mulleins are about the only weeds. *Spergula arvensis* lines the woodsides,—a pretty pearly flower earlier, but now dying, with heavy pods on angular deflexed pedicels.

I climbed Mt. La Fayette (5240 feet) and found on the very summit the *Veratrum viride* that grows at sea-level (also, I am told, on Roan Mt., Tenn.) I found *Geum radiatum* var·*Peckii*, *Bryanthus* (once *Phyllodoce*), *Sedum*, creeping snow-berry (and snow-birds), mountain cranberry, *Potentilla tridentata*, *Smilacina*, dwarf-willow, stunted fir, two birch, and, of course, blueberries, berberry, and mountain sandwort *Clintonia* and *Coptis Potentilla*.

Just as we were descending from the summit we saw a young rabbit crouching among the rocks. He did not seem much afraid, and limped gently off at our near approach. He and the snow-bird were the fauna of the mountain top.

Also, in our explorations, a bit of down or the coma from some seed was borne toward us against the sun and disappeared in the north.

On the way up and down we refreshed ourselves constantly at the bountiful springs of cold, slightly bitter water that lined the path, and with red raspberries of delicious flavor.

In the region are lower hills, in the forest of which the flora is most interesting. Mountain Ash and boneberry, the *Tiarella*, *Aralia nudicaulis*, and *Microstylis ophioglossoides* were some of my finds. Also several Habenarias, a red-berried *Trillium*, a number of Lycopodiums and strange, finger-like, yellow fungi, under the very dark spruce and fir woods.

The open uplands are rocky and, as I have said, covered with Sweet Fern and Wood Fern and with Cinnamon Fern, which you know does not turn brown and wither, but changes to a deep golden brown, making a most sunny effect. Besides this, there are armies of Steeple bush. By the trickles grow *Drosera* and Sundrops (*Œnothera pumila*,) *Tiarella and Hydrocotyle ;* and where the upland slopes into bog come the speckled alder, beaked willow, spongy sphagnum, quantities of *Spiranthes*, tall buttercups, and hawkweed and Cinnamon Ferns. Ostrich fern (*Onoclea Struthiopteris*) is quite frequent,—as is also Maiden-hair. On the whole, few regions could present a cheerier autumn scene."

TUSSILAGO FARFARA L.—I consider myself meeting with a piece of good fortune if sometime during the season I chance to meet in my wild flower rambles, a new find—a flower or plant I am not acquainted with or at least one we seldom meet and do not know the name and place in the wild flora. *Tussilago Farfara L.* or Coltsfoot, — also called Cough-wort, Foal's Foot, Horse Hoof, etc.,—is one of my latest acquaintances of the season and is one that has eluded my search for bloom during the last two or three years,—in fact it appears to have bloomed before I suspected it would flower. This has rather excited my admiration of it, as I had heretofore supposed I was out early enough in the vernal season to catch all the shy bloomers, even to the Skunk Cabbage, from which the bees collect their first pollen ; but as this plant is only infrequently found in our State it is only at intervals I have chanced to meet it,and doubtless have always missed it during its blooming season in early spring,—when I have seen it, it was when the leaves were but partially developed, woolly, and no appearance of a scape or bloom.

During the first week of October I came across two or three fine colonies of this plant with its large conspicuous leaves 6 to 9 inches long, 5 to 7 inches wide with petioles 9 inches in length. The root stalk had about three of these leaves, and its terminal bud was hidden by the base of the leaves, but seemed to be fully developed for next season's growth.

One writer says "Its presence is a *certain* indication of a clayey soil,"—and this is my observation where ever I have met it growing.

Prof. Gray says in his Manual " Thoroughly wild" (Nat. from Europe). In the "Catalogue of all Phænogamous and Vascular Cryptogamous Plants growing without cultivation in the State of Connecticut," 1896, seven stations are given,—Waterbury not included, but could have been reported, as I have found it here in two separate localties.

JOHN K. GOODRICH.

Waterbury, Conn.

A beautiful plant but dangerous to the cultivator, as every piece of root will make a new individual. It may be imagined that it regards itself as having a mission, and forces its company where it is not wanted in order to render good service as " colts-foot tea " in cases of colds and similar complaints.

BARK WITHIN THE WOOD OF TREES.—In cutting across the stems of Wistarias, hornbeams, Bauhinias, and other trees which have irregular outlines, bark will often be found far within. But there is little mystery about it when the conditions of increase in the woody structure is understood. Setting aside the botanical terms of xylem, phloem, cambium, and so on, which students of vegetable physiology so freely use, it may be explained that life can only proceed from life. Wood is formed by new living cells proceeding from older cells which eventually form the woody trunk of the tree. But cells can only grow freely where there is an abundance of food to construct the cell material. A whole line of cells down the trunk of a tree will often get more food than an adjoining line,—and, with plenty of food, plenty of wood is formed on that line. The poverty stricken line makes little wood. As in society the rich can get richer and the poor poorer, so it is with these rich cells. Year by year the numerous rich cells increase, and the result is a fluted form of trunk. These richer growths eventually meet, overflowing the poorer neighbors, which are thus covered in, bark and all. It is a simple story.

BARE ROCKS.—Perhaps the MONTHLY will tell us sometime if such a thing exists in nature as an absolutely *bare rock*. I am often interested in my rambles among the rocks to note the variety and abundance of low forms of vegetable growths,—lichens, etc.—on even dry, exposed rocks, while of course, on damp ones, the growth is richer and more varied still—and I believe I have never yet seen one that was entirely bare of all growth, have you ?

C. F. SAUNDERS.

Possibly no rock is absolutely bare after a few months exposure to the atmosphere. The microscope would disclose numerous animal and vegetable organisms in every part of its surface. It is these invisible but wonderfully active creatures which prepare soil for organisms of larger and more complex mould. Mosses and lichens, which the naked eye can behold, soon follow, and if all things are favorable, the naked rock soon becomes completely clothed with verdure. It is believed by some that they aid the wind and weather in making earth out of the rocks, and thus preparing soil.

PELLÆA GRACILIS.—Mention has occasionally been made of this rare fern in MEEHANS' MONTHLY, and its distribution towards the south as well as to altitude have interested me. It is eminently a northern fern,—I have met with it but once in many years collecting, having found it in 1874 near the city of Kankakee, Ill. It grew in crevices of limestone bordering a narrow ravine that set back from the Kankakee River. The altitude above the sea is about six hundred feet. This is the only station where I have seen mention of it in this State. Nor does it appear in the States immediately east or west till we come to the northern border of Iowa (Emmet County), and the adjoining part of Minnesota (Marten County). But this is nearly two hundred miles to the north. It occurs in New Jersey in about the same latitude as at Kankakee, 41°. In the Rocky Mountain region it goes somewhat farther south, and possibly in the Alleghenies, though our botanies do not so specify. The station at Kankakee is evidently on the southern border of its range in the plain region, and is remarkable for its isolation and low altitude. Tho other Cliff Brake, *Pellœa atropurpurea*, grew in the same locality, but was of a somewhat different habit as seen here or where I have found it elsewhere several times. *P. gracilis* grew quite in the shade, on shelves of horizontal strata which had partially disintegrated, leaving cavities roofed over by the next stratum above. Here the little fern was well protected, and one had to reach in to get them. *P. atropurpurea* grows in more exposed places on narrow shelves or projections along the vertical faces of cliffs, or on any slight protuberance or in shallow cavities where it can gain a foothold.

E. J. HILL.

Chicago, Ill.

HOW PLANTS FEED.—In the papers that have recently appeared in MEEHANS' MONTHLY on various problems in plant life, it has been noted that though the old notion of an upward and downward current of sap has been abandoned, no one yet knows in what manner the carbon necessary to build up the woody structure of a tree is carried from the leaves down to the farthest root-point. The whole trunk of a tree is little more than charcoal and water. Carbonic acid gas abounds in the atmosphere. This is formed of two elements, carbon—practically charcoal—and oxygen. The leaves absorb this gas, and in the leaf the oxygen is taken out and given back to the atmosphere,—while the carbon in some mysterious manner goes to form the annual woody layer of the whole structure. Prof. F. T. Shutt, of the Canadian Department of Agriculture, in a recent treatise, well says:

"Very little is known as to the precise manner in which the decomposition of carbonic acid is effected within the plant. It is known, indeed, that the decomposition is in some way intimately connected with the green chlorophyl grains to which the color of the leaves is due; and it is known that light is necessary in order that the decomposition may be brought about."

MAGNOLIA GLAUCA IN PENNSYLVANIA.—The one who travels the woods and fields on botanical tours is constantly meeting with some rare tree or plant new to him, and it is this that gives a good deal of zest to the pursuit. The *Magnolia glauca* is not uncommon in Southern Pennsylvania,—indeed, I have seen it myself growing in Delaware County, just outside the city limits of Philadelphia. But it remained for a good friend, and a good botanist too, Mr. George Redles, Jr., of Germantown, to give me a great surprise the past summer by taking me to a veritable magnolia swamp, right in the heart of Montgomery County, and not far from the new Willow Grove Park, near Edge Hill. This is not a swamp containing but a dozen or so of trees, there are perhaps fifty trees in it, and from their size they are of great age. Some of them are a foot in circumference and 25 feet high. The soil is so springy that one's steps have to be picked with care. And thriving in the sphagnum moss are nice plants of the common Sundew, *Drosera rotundifolia*.

How pleasing and how surprising it is to find miles and miles away from any other tree of it such a rare and beautiful tree as this and in such a large grove?

W. Wynne Wister, who in his younger days botanized this locality pretty thoroughly, told me he had no idea this tree could be found in such abundance on this, the Pennsylvania, side of the Delaware River.

JOSEPH MEEHAN.

GENERAL GARDENING.

PLANT THE TREE.

Bring forth the tender shrub, the tree and vine,
And plant them by the house or in the field;
They will in time, we hope, for thee or thine,
Reward all toil—a precious harvest yield.

If not for us, for others they will bear
The shining apple, pear or luscious peach;
The jucy grapes, all sparkling bright and rare,
Will smiling hang within an easy reach.

Plant oak or ash in useless spots of ground,
A birch or willow at the murmuring brook,
Some flowering shrub upon the grassy mound,
Or useful tree in any vacant nook.

The graceful maple and the fragrant pine,
In schoolhouse grounds where children love to play;
Some hardy trees along the highway's line,
To shade the traveler on his tiresome way.

The birds will carol from their leafy bower,
And build their nests with tender, loving care;
The bees will gather sweets from every flower,
Whose store of honey you may live to share.

And when you're gone beyond this earthly sphere,
Your labors in each season's round will bring—
To bless your memory and to keep it dear—
The fruit in autumn and the flowers in spring.

—C. L. LOCHMAN.

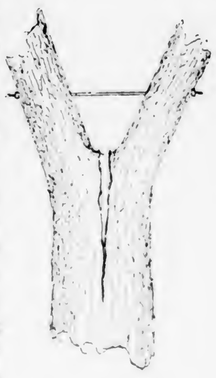
Bethlehem, Pa.

GOOD ROADS IN VIRGINIA.—An observing philosopher has stated that the condition of the highways is the best measure of the advance of a community in civilization. The *Richmond Dispatch* notices the good work done for the splendid thoroughfares in the vicinity of Richmond,—all evidences of the taste, generosity and forethought of Major Louis Ginter. Lovers of gardening are usually in the advance in public spirited occupations, and when it is remembered that Major Ginter is one of the best known of the amateur gardeners of Richmond, no one is surprised at his eminence as a good citizen.

A CATALPA CATERPILLAR. — Mr. E. L. Resh, of Bird-in-Hand, Pa., sends a specimen of a caterpillar, which has made considerable havoc among the leaves of the Catalpa—probably the eastern species, *Catalpa bignonioides*. Prof. L. O. Howard, of the United States Department of Agriculture, decides that it is the larva of one of the Hawk Moths, *Sphinx Catalpæ*. By the name it can be inferred that its feeding habits have been long known,—but it is the first time that any serious trouble, from "worms" on the Catalpa tree, has been brought to the notice of the conductors.

PRESERVING WIND-SPLIT TREES. — In a public park, in one of our large cities, a magnificent specimen of the White Ash which had been long famed for its magnificent size and fine proportions was ordered taken down by the park superintendent because it had been wind shaken in some such manner as indicated in the sketch, and it was regarded as dangerous to life in that condition. Tears were actually shed by some tender-hearted tree-lovers over the fallen trunk.

It does not seem to be generally known that such injuries may be assisted by a bolt and nuts, as shown in the sketch. A half inch rod is quite strong enough, and inch nuts are all that is needed. The nuts will become completely imbedded by the tree growth in a few years, with no bad result. By the help of ropes on the upper portion of the branches, and help from the wrench on the nuts, the cleft can be drawn together so closely that the wood will eventually grow together again,—that is the new growth will cover the cleft, for old wood is dead wood, and that cannot unite.



Bands connected by chains have been sometimes used to prevent further separation of a cleft, but these prevent the growth, and act like girdling, the final result being the death of the portion above the band.

GOOD ROOTS IN TRANSPLANTING TREES.—Mr. H. M. Stringfellow, a fruit grower of Texas, and who is regarded in that section as a good authority on practical fruit culture, has lately startled planters by contending that young trees planted for orchards, or, one may say, for anything else, are better without roots than with them. He cuts in all the roots to a mere stump, making the tree little more than a cutting. The top is of course cut in severely at the same time. It is argued that there is a great point gained, provided such trees are equally successful—with trees transplanted under the ordinary method with us. Many more can be packed in a case for shipping in this way, and heavy transportation charges thus avoided. It has been long the thought of the writer that by far too much value is placed on the root fibers; and distinction should be made between the true roots and root fibers. The fiber is practically only a thread-like production which pushes out of the main roots in large quantities. They live only for one year, just as the leaf does, and they can be of very little practical use to a tree in transplanting. The success of transplanted trees comes from the new production of these fibers. The food of a tree is taken in by the root hairs, which are produced at the end of these little threads, and, unless there is a new production of these fibers, the tree will not grow. What is needed in a successful transplanting is an abundance of two or three year old roots, and not annual fibers. It is this which makes a transplanted tree much more of a success than one not transplanted. When the large, old roots are shortened, and a number of new, true roots proceed, this is the class of roots desirable. If there are a number of this class to the main stem of the plant, we should be apt to regard all the other mass of very old roots and half dead fibers as being in the way of success rather than to aid it. For trees generally, Mr. Stringfellow's method will not be adopted, but his thought is useful in showing us the absurdity of many of our old views.

FRAGRANT FLOWERS, GELSEMIUM SEMPERVIRENS, OR YELLOW (FALSE) JESSAMINE.—This vine has been but sparingly introduced in the gardens throughout the country. I have seen it described in a Florida catalogue, but never anywhere else. I met with it in the '50's, and there was no question of its hardiness growing in a city lot of Annapolis, Maryland. It never had protection in any way. In the same lot was an almond tree which produced its nuts regularly as well as fig trees. The Crape Myrtle grew there also. The figs had a protection of the south walls of buildings. In the latitude of Annapolis, it is perfectly hardy. In a garden in that city, I saw it growing over and well covering an arbor. It has a delicious fragrance which is wafted around on every zephyr. The flowers are large and showy, of a bright golden yellow, length of corolla one to one and a half inches. It has handsome oval leaves, many of them hanging through the winter till spring. In the south it is an evergreen. "Gray" says, that its home is in the low grounds of eastern Virginia and southward. I think that this vine will grow and thrive in Philadelphia and the surrounding territory with some slight protection. It is worth cultivation, is a perennial whose top does not die down in winter, and is a thing of fragrance and a beauty forever.

L. K. STEELE.

Festus, Mo.

The Carolina Jasmine gets killed to the ground most winters in Philadelphia, when exposed to the ordinary bright light of the snowy season. When carefully protected from the bright winter sun, it might get through. Many years ago there was a plant in the Laurel Hill Cemetery, in Philadelphia, that had grown up among the English Ivy, on an old wall. It may be there yet. It was secure in the shade of the ivy leaves, and flowered nicely every year. Several plants are now being cultivated under slight protection in the Meehan nurseries.

INSECTICIDES. — There are now numerous popular insecticides, but it is not always material is at hand. Every new formula is welcome. Mr. Doogue, the well known city gardener of Boston, says, that "Canada hardwood ashes, containing eight per cent. and upward of potash, with one-third of slaked lime added, is absolutely destructive to all insect life.

At the same time this combination is admittedly a valuable fertilizer for any kind of crop. This combination acts very quickly, as the lime and magnesia unite rapidly with the carbonate and caustic properties of the potash."

OUVIRANDRA FENESTRALIS, THE MADAGASCAR LATTICE-LEAF.—The note in MEEHANS' MONTHLY for October, on the Lattice-leaf, (page 189,) has induced me to send you a photograph of a full-sized leaf of this wonderful plant. The photograph is printed from nature, and is therefore a truthful likeness of this leaf. I am sure you will confer a favor on your readers by illustrating it in an early issue. It is a plant that should be more commonly grown, as it is not a difficult subject by any means.

What it needs, is a temperature of from 75° to 80°, and a tub or half-barrel filled with water to grow it in. The soil may consist of good loam and well rotted cow manure, or a mixture of loam, cow manure, and leaf-mould or peat,—whichever may be at hand. The plant will do equally well in either, as it is not so particular as to soil, as it is to clean, sweet water. The pot or pan, which ever is used, is to be sunk in the water so that there will be several inches of water over the leaves,—say four or five inches. The plant must be kept away from direct sunlight. It is more commonly known under its old name of *Ouvirandra fenestralis* than *Aponogeton fenestrale*, and the plant is generally catalogued under the name of *Ouvirandra*.

P. BISSET.

Washington, D. C.

MADAGASCAR LATTICE-LEAF.

It will be well for us garden folk to retain the name *Ouvirandra*, given by Thourin, to the Madagascar plant in 1806, instead of changing to the *Aponogeton* given by the younger Linnæus in 1781, for the reason that the species combined under *Ouvirandra* have a distinct character. Botanists will probably write their tickets *Aponogeton* (*Ouvirandra*) *fenestrale*; and it does seem that where there is distinction enough to retain a botanical name for a section as a sub-genus, it is not worth while for general literature to recall its work of probably fifty years in the general distribution of the name. The cut is half size.

FRUIT AND FLOWER CALENDARS.—Those good old monks who lived in France and prepared a calendar of the first opening of a large number of flowers and then dedicated each to a Saint's day, which may have been fixed for commemoration of that day, would have a difficult task to form a calendar for the first coming of the fruits and flowers of our country. While the flowers are opening in one part of our wide territory, the fruit is ripening in another. It would, however, be very interesting if some sort of a table could be arranged by which we could see the differences in the different localities. To be useful, however, such a calendar would have to be very carefully prepared. The writer has just noticed a paragraph in the *Rural Northwest*, published at Portland, Oregon, saying that the date for the first ripening of blackberries in the vicinity of Portland was July 20th; but it does not say whether these are the cultivated varieties of blackberries brought from the East, or whether they are the native blackberries of that region. The writer has collected plants in the vicinity of Portland, and in fact along the line of the Columbia River, but believes there are only two species growing wild in that region that may be recorded as blackberries, so far as their fruit is concerned,—one of these is closely related to our Black-cap Raspberry, and the other to the dew-berry.

NUXVOMICA FOR CUT-FLOWERS.—Dr. Samuel G. Dixon notes.—"I hope you will try tincture of Nuxvomica as a stimulant or tonic for cut-flowers, as the Chrysanthemums I tried it on are certainly holding their freshness to a very unusual degree." We have not heard of this before.

GOOD ROOTS IN TRANSPLANTING TREES.—Mr. H. M. Stringfellow, a fruit grower of Texas, and who is regarded in that section as a good authority on practical fruit culture, has lately startled planters by contending that young trees planted for orchards, or, one may say, for anything else, are better without roots than with them. He cuts in all the roots to a mere stump, making the tree little more than a cutting. The top is of course cut in severely at the same time. It is argued that there is a great point gained, provided such trees are equally successful—with trees transplanted under the ordinary method with us. Many more can be packed in a case for shipping in this way, and heavy transportation charges thus avoided. It has been long the thought of the writer that by far too much value is placed on the root fibers; and distinction should be made between the true roots and root fibers. The fiber is practically only a thread-like production which pushes out of the main roots in large quantities. They live only for one year, just as the leaf does, and they can be of very little practical use to a tree in transplanting. The success of transplanted trees comes from the new production of these fibers. The food of a tree is taken in by the root hairs, which are produced at the end of these little threads, and, unless there is a new production of these fibers, the tree will not grow. What is needed in a successful transplanting is an abundance of two or three year old roots, and not annual fibers. It is this which makes a transplanted tree much more of a success than one not transplanted. When the large, old roots are shortened, and a number of new, true roots proceed, this is the class of roots desirable. If there are a number of this class to the main stem of the plant, we should be apt to regard all the other mass of very old roots and half dead fibers as being in the way of success rather than to aid it. For trees generally, Mr. Stringfellow's method will not be adopted, but his thought is useful in showing us the absurdity of many of our old views.

FRAGRANT FLOWERS, GELSEMIUM SEMPERVIRENS, OR YELLOW (FALSE) JESSAMINE.—This vine has been but sparingly introduced in the gardens throughout the country. I have seen it described in a Florida catalogue, but never anywhere else. I met with it in the '50's, and there was no question of its hardiness growing in a city lot of Annapolis, Maryland. It never had protection in any way. In the same lot was an almond tree which produced its nuts regularly as well as fig trees. The Crape Myrtle grew there also. The figs had a protection of the south walls of buildings. In the latitude of Annapolis, it is perfectly hardy. In a garden in that city, I saw it growing over and well covering an arbor. It has a delicious fragrance which is wafted around on every zephyr. The flowers are large and showy, of a bright golden yellow, length of corolla one to one and a half inches. It has handsome oval leaves, many of them hanging through the winter till spring. In the south it is an evergreen. "Gray" says, that its home is in the low grounds of eastern Virginia and southward. I think that this vine will grow and thrive in Philadelphia and the surrounding territory with some slight protection. It is worth cultivation, is a perennial whose top does not die down in winter, and is a thing of fragrance and a beauty forever.

L. K. STEELE.

Festus, Mo.

The Carolina Jasmine gets killed to the ground most winters in Philadelphia, when exposed to the ordinary bright light of the snowy season. When carefully protected from the bright winter sun, it might get through. Many years ago there was a plant in the Laurel Hill Cemetery, in Philadelphia, that had grown up among the English Ivy, on an old wall. It may be there yet. It was secure in the shade of the ivy leaves, and flowered nicely every year. Several plants are now being cultivated under slight protection in the Meehan nurseries.

INSECTICIDES. — There are now numerous popular insecticides, but it is not always material is at hand. Every new formula is welcome. Mr. Doogue, the well known city gardener of Boston, says, that "Canada hardwood ashes, containing eight per cent. and upward of potash, with one-third of slaked lime added, is absolutely destructive to all insect life.

At the same time this combination is admittedly a valuable fertilizer for any kind of crop. This combination acts very quickly, as the lime and magnesia unite rapidly with the carbonate and caustic properties of the potash."

OUVIRANDRA FENESTRALIS, THE MADAGASCAR LATTICE-LEAF.—The note in MEEHANS' MONTHLY for October, on the Lattice-leaf, (page 189,) has induced me to send you a photograph of a full-sized leaf of this wonderful plant. The photograph is printed from nature, and is therefore a truthful likeness of this leaf. I am sure you will confer a favor on your readers by illustrating it in an early issue. It is a plant that should be more commonly grown, as it is not a difficult subject by any means.

What it needs, is a temperature of from 75° to 80°, and a tub or half-barrel filled with water to grow it in. The soil may consist of good loam and well rotted cow manure, or a mixture of loam, cow manure, and leaf-mould or peat,—whichever may be at hand. The plant will do equally well in either, as it is not so particular as to soil, as it is to clean, sweet water. The pot or pan, which ever is used, is to be sunk in the water so that there will be several inches of water over the leaves,—say four or five inches. The plant must be kept away from direct sunlight. It is more commonly known under its old name of *Ouvirandra fenestralis* than *Aponogeton fenestrale*, and the plant is generally catalogued under the name of *Ouvirandra*.

P. BISSET.

Washington, D. C.

MADAGASCAR LATTICE-LEAF.

It will be well for us garden folk to retain the name *Ouvirandra*, given by Thourin, to the Madagascar plant in 1806, instead of changing to the *Aponogeton* given by the younger Linnæus in 1781, for the reason that the species combined under *Ouvirandra* have a distinct character. Botanists will probably write their tickets *Aponogeton* (*Ouvirandra*) *fenestrale*; and it does seem that where there is distinction enough to retain a botanical name for a section as a sub-genus, it is not worth while for general literature to recall its work of probably fifty years in the general distribution of the name. The cut is half size.

FRUIT AND FLOWER CALENDARS.—Those good old monks who lived in France and prepared a calendar of the first opening of a large number of flowers and then dedicated each to a Saint's day, which may have been fixed for commemoration of that day, would have a difficult task to form a calendar for the first coming of the fruits and flowers of our country. While the flowers are opening in one part of our wide territory, the fruit is ripening in another. It would, however, be very interesting if some sort of a table could be arranged by which we could see the differences in the different localities. To be useful, however, such a calendar would have to be very carefully prepared. The writer has just noticed a paragraph in the *Rural Northwest*, published at Portland, Oregon, saying that the date for the first ripening of blackberries in the vicinity of Portland was July 20th; but it does not say whether these are the cultivated varieties of blackberries brought from the East, or whether they are the native blackberries of that region. The writer has collected plants in the vicinity of Portland, and in fact along the line of the Columbia River, but believes there are only two species growing wild in that region that may be recorded as blackberries, so far as their fruit is concerned,—one of these is closely related to our Black-cap Raspberry, and the other to the dew-berry.

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INTENTIONAL SECOND EXPOSURE

DODDER.—A correspondent writes: "'Along Butter Creek, Ore., has appeared a vine that when above the ground will leave the root and cling to any vegetation to which it can attach itself and through which it can draw nourishment. The seed is said to have been brought there with alfalfa seed from Salt Lake.'

The above from this morning's Philadelphia *Ledger* would indicate that *dodder* was a novelty to the observers along Butter Creek, wouldn't it?''

This is believed to be the European Clover Dodder, *Cuscuta Europœa*, which has been introduced with clover seed, and has found a tasteful host plant in the Alfalfa, a close relative of the clover. There is no excuse for the spread of this parasite. Anyone who has eyes can see the thread-like growth, which can be cut off in a few minutes, and nothing but sheer ignorance or indifference would allow it to remain long enough to go to seed.

NEW JERSEY TEA PLANT FOR DWARF HEDGES.—Very little seems to have been said of the "Jersey Tea" (*Ceanothus Americana*) as a plant for hedges; but when a low hedge is wanted that will take care of itself, not grow beyond bounds and look well at all seasons, no native species seems better than this. The Jersey Tea will stand much drouth. In spring it puts forth fresh stems and leaves and is soon covered with a multitude of feathery blossoms. When the leaves have fallen, the erect red brown stems are still pretty. The winter kills these back nearly to the ground each year in this latitude, saving the labor of the gardener's shears, unless it be to cut off the old stems in early spring.

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BOTANY IN A CITY LAWN.—It has often been a matter of interest to the writer that such a large number of species of plants may be found among the grass in a city lawn. The matter is brought freshly to mind by the following note from Mr. Newlin Williams:

"Philadelphia, May 16th. Our city grass plot has been sodded lately. It probably does not comprise in all an area more than twenty feet square, and at a glance one would think it grass and clover only. But in watering it and setting plants about its borders I have become more intimate with it, and find we have quite a botanic garden at our door. A few butter cups rose up and bloomed after the first watering. The children found open dandelions in it even before it was all laid. There are at least two kinds of clover, two plantains, a sedge, a Bouncing-Bet, and two things which could only have come from a low meadow,—Water Horehound and peppermint. There are motherwort, younglings of wild carrot, cinquefoil, violets even; a dock, three-seeded mercury, vervain, honewort, chick-weed, and the gem of all, the pale blue creeping Veronica. Seventeen! And thus, while I am daily expecting to happen upon others, I am at the same time dreading the day when they will all have to be clipped down to a kempt and urban level.

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LANDSCAPE GARDENING ON THE PACIFIC COAST.—Mr. George Hansen, formerly in charge of the Foothill Agricultural Experiment Station, at Jackson, Amador Co., California, has decided to establish himself as a Landscape Gardener and Architect at Oakland, California, — a profession for which he is eminently qualified.

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In many respects the insect has a peculiar history as it journeys through the various stages of its life, and the accompanying illustrations prepared by Mr. L. O. Howard for the Year Book of Agriculture, for 1895, and which we have been kindly permitted by Hon. Sterling Morton to copy for our readers, will be as interesting as it is practically instructive.

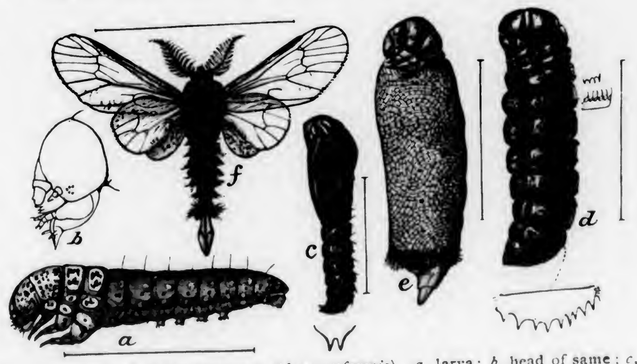

FIG. 83.—Bagworm (*Thyridopteryx ephemeræformis*). *a*, larva; *b*, head of same; *c*, male pupa; *d*, female pupa; *e*, adult female; *f*, adult male—all enlarged (original).

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"The handsome gooseberry which you saw at Nanaimo, B. C., is *Ribes Lobbii*, which is a most beautiful shrub whether seen in early spring when covered with its rich crimson-purple and white flowers (like miniature fuchsia flowers) or in August when loaded down with

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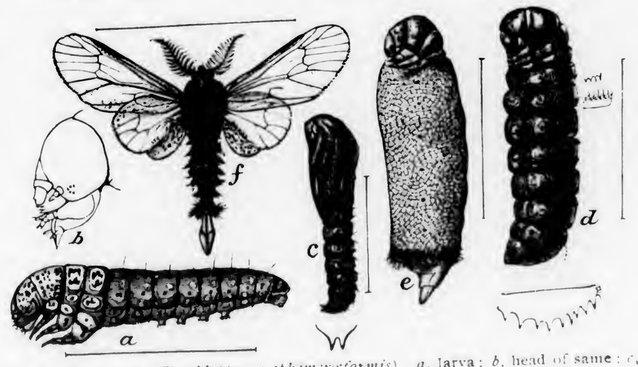

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INTENTIONAL SECOND EXPOSURE

the large ruddy fruit. The resinous glandular coat of the fruit makes it rather distoothful, but the pulpy interior is quite as pleasant as that of many of the cultivated varieties. This species is not hardy here without protection ; but bushes grown from seed flowered for two or three years on such branches as were well covered with snow. I judge that it would succeed well in such districts as *R. sanguineum* will thrive. It is a vigorous grower and flowers the second year from the seed. I find that it is an extremely rare species in collections."

J. FLETCHER,
Botanist to Department of Agriculture.
Dominion of Canada.

The shore line of British Columbia has its climate mollified by the warm water of the sea of Japan flowing northwardly along its line, in the same manner that the British Isles have theirs softened by the gulf stream. Though so far north, the native plants will not endure the winters of our Atlantic coast. But such an interesting plant as this would be well worth introducing as a conservatory plant.

Ribes Lobbii is a comparatively newly discovered plant, having been first described so recently as 1876, in the "American Naturalist," by Dr. Asa Gray.

DWARF BLACK JACK OAK.—Last summer, when botanizing in the vicinity of Millville, N. J., I came on what was to me a great curiosity, in the shape of a dwarf form of the Black Jack Oak, *Quercus nigra*. In botanical works this oak, *nigra*, is described as a small, gnarled tree, with a trunk 20 to 30 feet high. I had been accustomed to seeing this oak in great quantity all throughout South Jersey, and of various sizes, but near me on the occasion referred to were quite a number of trees, full of acorns, of all sizes from 2 feet up to 20 and 30 feet of the botanies. And as it was a good season for acorns of most all kinds, these little dwarfs were just as full of fruit as they could be. It was a pleasing surprise to me, the more so as the little fellows were not of stunted growth, but appeared as vigorous as the largest ones. Should this dwarf feature be a permanent one, as I have no doubt it is, this little oak would be a beautiful lawn ornament, as *nigra* has long been admired for its large pretty shaped, shining green leaves.

JOSEPH MEEHAN.

COSMOS ATRO-SANGUINEA. — A very dark blood-red Cosmos, under the name of *Cosmos atro-sanguinea*, has been introduced from Mexico to English gardens. It goes there by the name of the Black Dahlia. There is little difference between a Dahlia and a Cosmos. The leaves of this one look more like the leaves of a Dahlia than do those of the common Cosmos.

THE HARDY FLOWER GARDEN.

HELENIUM AUTUMNALE.—Those who are fond of cultivating our wild flowers in their gardens will find our common Sneeze-weed (*Helenium autumnale*) one of the best for that purpose. When properly cared for it makes a strong clump six feet or more high and bears a profusion of bright yellow flowers of a pattern not very common with composites. The disks are globular and appear to rest on the inner ends of the ray flowers. The plant has the added charm of blooming at a time when other flowers are fading,—usually being contemporary with the beautiful New England Aster and the Fringed and Closed Gentians.

Binghamton, N. Y. WILLARD N. CLUTE.

THE GIANT SPIDER PLANT.—Dr. Wm. Morrissy, Brooklyn, New York, sends a photograph of a remarkably finely grown specimen of the Giant Spider Plant, with the following note:

"Accompanying this letter is a photograph of a plant,—the Giant Spider Plant,—which grew in our garden this summer. It reached a height of eight feet and at one time had sixty-four large flowers upon it. It is from self-sown seed. It belongs to the Caper family, and I believe it is a cultivated *Polanisia*. It began to bloom in early June and has remained in bloom ever since. To-day I counted forty-three large racemes of flowers on it. What do you think of it for a whole flower garden of one plant?"

WILLIAM P. MORRISSY.

Certainly a remarkable specimen of a curious plant. There are quite a number of kinds of flowers that have honored the spider by bearing the name of Spider Flower, from the arachnoidal resemblances. As our correspondent remarks, this is a capparidaceous plant,—the family to which the Caper of the culinary department belongs to, but there is no record that this plant has a similar pungent character in the seed. Possibly it may have and the vegetable as well as the flower garden claim a share of its attention. Polanisias are all now regarded as *Cleomes*. In our younger days this was known as *Cleome pentaphylla*. Its native home is everywhere in tropical regions.

EARLY BLOOMING COSMOS.—I have been watching some early blooming *Cosmos bipinnata* planted in a neighbor's spent hot bed this spring. They have been flowering more or less all summer, but put me in mind of a chicken at its moulting period, as the foliage was very thin. One of the beauties of the old-fashioned Cosmos, — its foliage — was gone ; but what I want to record is this : Self-sown Cosmos have come up all around the plant, and are now some eight to ten inches high, and have bloom buds — generally only one bud,—the crown ; but in a few instances there are side branches. What a change in a plant that, a few years ago, was only known to bloom about October. And furthermore one that bloomed about that time, whether started in heat in February, March, April, or May, or seeded out doors. Had this fact any influence on the recent election ?

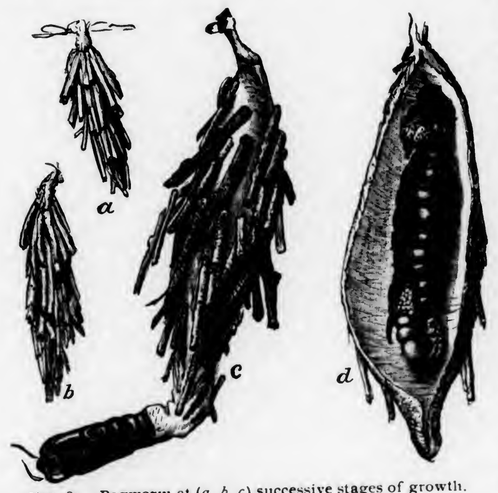

FIG. 84.—Bagworm at (*a*, *b*, *c*) successive stages of growth. *c*, male bag ; *d*, female bag—natural size (original).
(See article page 253.)

There never were any Cosmos in this hot bed, so there is no question about the fact that this October-blooming plant bloomed, ripened its seed, dropped them, and they germinated, grew and bloomed,—and all done in one season.

Of course, being near Chicago, and owned by a Chicago man, they absorbed Chicago energy, and did in one season what a Philadelphia Cosmos would take two or more to do. [Of course. *Conductors*.] Still the fact is worth noting.

W. C. EGAN.

FRUITS AND VEGETABLES.

IMPROVED SAND CHERRIES.—Nothing is more remarkable in nature than a habit she has of now and then introducing to us individuals of a species, usually of humble growth, in the form of small trees. This is especially true when the species is growing in localities somewhat out of what might be termed their geographical centre. The writer of this has seen the Beach Plum, which is but a trailing bush but a foot or two high in the sands of New Jersey, form bushes nearly as high as himself in Montana. The sand cherry, *Cerasus pumila*, often varies in this way. Some forty years ago the writer received from H. A. Terry, then of Iowa City, Iowa, a plant of one, which, in his Germantown garden, was quite as vigorous as an average Mahaleb. By selection and care, some great improvements might be made. Mr. A. W. Latham, Secretary of the Minnesota Horticultural Society, notes that this good work has already begun. He saw on the grounds of Mr. Knudson, at Springfield, Minnesota, a specimen of an improved variety that was eight or nine feet high, and but five years old. The red fruit is an inch in diameter, has lost the usual astringency of the sand cherry, and is more of the flavor of the Miner Plum. Mr. Knudson deserves encouragement in this effort to improve this line of the cherry family.

TURNIP-ROOTED, OR TAP-ROOTED VEGETABLES.—Among radishes, beets, and carrots, there are kinds with long roots penetrating the soil deeply,—and turnip-rooted kinds which grow near the surface. The latter are usually the earlier ; but epicures say the tap-rooted kinds are preferred by those who know delicacy from coarseness.

the large ruddy fruit. The resinous glandular coat of the fruit makes it rather distoothful, but the pulpy interior is quite as pleasant as that of many of the cultivated varieties. This species is not hardy here without protection ; but bushes grown from seed flowered for two or three years on such branches as were well covered with snow. I judge that it would succeed well in such districts as *R. sanguineum* will thrive. It is a vigorous grower and flowers the second year from the seed. I find that it is an extremely rare species in collections."

J. FLETCHER,
Botanist to Department of Agriculture.
Dominion of Canada.

The shore line of British Columbia has its climate mollified by the warm water of the sea of Japan flowing northwardly along its line, in the same manner that the British Isles have theirs softened by the gulf stream. Though so far north, the native plants will not endure the winters of our Atlantic coast. But such an interesting plant as this would be well worth introducing as a conservatory plant.

Ribes Lobbii is a comparatively newly discovered plant, having been first described so recently as 1876, in the "American Naturalist," by Dr. Asa Gray.

DWARF BLACK JACK OAK.—Last summer, when botanizing in the vicinity of Millville, N. J., I came on what was to me a great curiosity, in the shape of a dwarf form of the Black Jack Oak, *Quercus nigra*. In botanical works this oak, *nigra*, is described as a small, gnarled tree, with a trunk 20 to 30 feet high. I had been accustomed to seeing this oak in great quantity all throughout South Jersey, and of various sizes, but near me on the occasion referred to were quite a number of trees, full of acorns, of all sizes from 2 feet up to 20 and 30 feet of the botanies. And as it was a good season for acorns of most all kinds, these little dwarfs were just as full of fruit as they could be. It was a pleasing surprise to me, the more so as the little fellows were not of stunted growth, but appeared as vigorous as the largest ones. Should this dwarf feature be a permanent one, as I have no doubt it is, this little oak would be a beautiful lawn ornament, as *nigra* has long been admired for its large pretty shaped, shining green leaves.

JOSEPH MEEHAN.

COSMOS ATRO-SANGUINEA. — A very dark blood-red Cosmos, under the name of *Cosmos atro-sanguinea*, has been introduced from Mexico to English gardens. It goes there by the name of the Black Dahlia. There is little difference between a Dahlia and a Cosmos. The leaves of this one look more like the leaves of a Dahlia than do those of the common Cosmos.

THE HARDY FLOWER GARDEN.

HELENIUM AUTUMNALE.—Those who are fond of cultivating our wild flowers in their gardens will find our common Sneeze-weed (*Helenium autumnale*) one of the best for that purpose. When properly cared for it makes a strong clump six feet or more high and bears a profusion of bright yellow flowers of a pattern not very common with composites. The disks are globular and appear to rest on the inner ends of the ray flowers. The plant has the added charm of blooming at a time when other flowers are fading,—usually being contemporary with the beautiful New England Aster and the Fringed and Closed Gentians.

Binghamton, N. Y. WILLARD N. CLUTE.

THE GIANT SPIDER PLANT.—Dr. Wm. Morrissy, Brooklyn, New York, sends a photograph of a remarkably finely grown specimen of the Giant Spider Plant, with the following note:

"Accompanying this letter is a photograph of a plant,—the Giant Spider Plant,—which grew in our garden this summer. It reached a height of eight feet and at one time had sixty-four large flowers upon it. It is from self-sown seed. It belongs to the Caper family, and I believe it is a cultivated *Polanisia*. It began to bloom in early June and has remained in bloom ever since. To-day I counted forty-three large racemes of flowers on it. What do you think of it for a whole flower garden of one plant?"

WILLIAM P. MORRISSY.

Certainly a remarkable specimen of a curious plant. There are quite a number of kinds of flowers that have honored the spider by bearing the name of Spider Flower, from the arachnoidal resemblances. As our correspondent remarks, this is a capparidaceous plant,—the family to which the Caper of the culinary department belongs to, but there is no record that this plant has a similar pungent character in the seed. Possibly it may have and the vegetable as well as the flower garden claim a share of its attention. Polanisias are all now regarded as *Cleomes*. In our younger days this was known as *Cleome pentaphylla*. Its native home is everywhere in tropical regions.

EARLY BLOOMING COSMOS.—I have been watching some early blooming *Cosmos bipinnata* planted in a neighbor's spent hot bed this spring. They have been flowering more or less all summer, but put me in mind of a chicken at its moulting period, as the foliage was very thin. One of the beauties of the old-fashioned Cosmos, — its foliage — was gone ; but what I want to record is this : Self-sown Cosmos have come up all around the plant, and are now some eight to ten inches high, and have bloom buds — generally only one bud,—the crown ; but in a few instances there are side branches. What a change in a plant that, a few years ago, was only known to bloom about October. And furthermore one that bloomed about that time, whether started in heat in February, March, April, or May, or seeded out doors. Had this fact any influence on the recent election ?

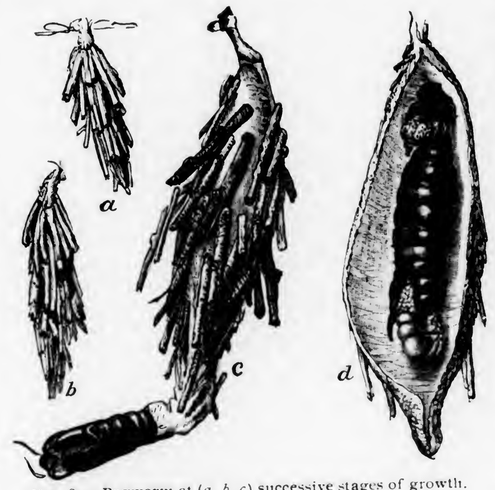

FIG. 84.—Bagworm at (*a*, *b*, *c*) successive stages of growth. *c*, male bag ; *d*, female bag—natural size (original).
(See article page 233.)

There never were any Cosmos in this hot bed, so there is no question about the fact that this October-blooming plant bloomed, ripened its seed, dropped them, and they germinated, grew and bloomed,—and all done in one season.

Of course, being near Chicago, and owned by a Chicago man, they absorbed Chicago energy, and did in one season what a Philadelphia Cosmos would take two or more to do. [Of course. *Conductors*.] Still the fact is worth noting.

W. C. EGAN.

FRUITS AND VEGETABLES.

IMPROVED SAND CHERRIES.—Nothing is more remarkable in nature than a habit she has of now and then introducing to us individuals of a species, usually of humble growth, in the form of small trees. This is especially true when the species is growing in localities somewhat out of what might be termed their geographical centre. The writer of this has seen the Beach Plum, which is but a trailing bush but a foot or two high in the sands of New Jersey, form bushes nearly as high as himself in Montana. The sand cherry, *Cerasus pumila*, often varies in this way. Some forty years ago the writer received from H. A. Terry, then of Iowa City, Iowa, a plant of one, which, in his Germantown garden, was quite as vigorous as an average Mahaleb. By selection and care, some great improvements might be made. Mr. A. W. Latham, Secretary of the Minnesota Horticultural Society, notes that this good work has already begun. He saw on the grounds of Mr. Knudson, at Springfield, Minnesota, a specimen of an improved variety that was eight or nine feet high, and but five years old. The red fruit is an inch in diameter, has lost the usual astringency of the sand cherry, and is more of the flavor of the Miner Plum. Mr. Knudson deserves encouragement in this effort to improve this line of the cherry family.

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INTENTIONAL SECOND EXPOSURE

IMPROVED STRAWBERRIES. — It is a well-known fact that the varieties of strawberries in use to-day are in no respects better, if indeed as good, as many varieties that were popular over a quarter of a century ago, and yet it is recognized by all hands that new varieties are essential. This chiefly comes from a disease caused by the operation of the strawberry fungus, which takes the form of small brown spots on the leaves. Wherever it occurs, the strawberry plants decline in health and general quality. As long as a variety can be kept free from this trouble, new kinds are not essential; but it seems, according to the experience of most strawberry growers, that sooner or later these little parasites will discover the most isolated plantations.

GRAPES UNDER GLASS.—Among the pleasures of gardening, raising grapes under glass is prominent. The Garden Committee of the Massachusetts Horticultural Society praise very highly one on the grounds of Mrs. J. W. Clark, of Pomfret, Conn. Mr. Ash's account of his method of cultivation is as follows:

"I would say, with regard to my mode of cultivating grapes that it is very simple. I start my grapery about February 15th, at a temperature of from 43° to 48° of artificial heat, allowing the sun heat to run it up to from 80° to 85° with moderate ventilation, keeping the house at these temperatures until the buds show signs of swelling, when I raise the artificial heat to 55°, night temperature, with a day temperature of 60°. I keep the house at this heat until the vines have made a growth of about three inches, when I again raise the temperature to from 60° to 65°, night, and from 65° to 70°, day. When starting my house I give the border a thorough soaking with water heated to 85°, repeating the operation once about two weeks before the vines are in bloom, at which time I keep the atmosphere in the house moderately dry, ventilating freely on bright days and only damping the floor about midday. This treatment is followed until the fruit is set, when I put on a top-dressing of barnyard manure and give the border a thorough watering with tepid water, repeating as often as is required. Just when the grapes commence to take their second swell, I give a copious watering with liquid manure and another similar dose just before the grapes begin coloring. After this I use only clear water, and when the grapes are ripe I keep the border as dry as possible without allowing the vines to suffer. My grapery is 50×20 feet.

The extent of this estate is one hundred acres; we have about six acres of lawn and flower garden, and about four acres of vegetable garden. We grow almost everything in the vegetable line. Besides the grapery we have a palm house 50×20; rose house 50×18; one house for general greenhouse flowering plants, 50×18, and a house for Carnations and Violets 100×10. The greenhouses are heated by hot water (overhead system), using two Foster boilers connected so that we can use either separately or in conjunction with each other."

A LARGE CURRANT.—Although no American garden in the northern half of our continent is considered complete without some currant bushes, it is rare we hear tell of them growing anywhere to the perfection that they do in England, although it is quite possible that they may successfully contend for the palm of superiority in Canada. The currant does not like long spells of warm dry weather; under these circumstances the leaves become a prey to parasite fungus, and we all know that injury to leaves is the first step towards deterioration. At a recent meeting of the Royal Horticultural Society in England, the red currant called the Comet was exhibited—in which the bunches were six inches long, and some of the berries half an inch in diameter. With these figures we may be able to decide how near American currant growers can come to this excellence of their English brethren.

POISONOUS PARSNIPS.—Noting paragraph in your September number about poisonous parsnips, will say that in the vicinity of my childhood's home, it was customary to save the seed of wild parsnips for garden planting. The roots of the wild parsnip were not used, for, being uncultivated, they were too small; but garden grown parsnips from wild parsnip seed supplied our table for many years. These parsnips were sweeter than the present varieties, though the roots were never as large. What they lacked in size was made up in quality.

MARY G. BOOTH.

Springfield, Mass.

THE APPLE AS A PROPHYLACTIC.—Many can testify from actual experience to the value of the following which appeared originally in the *New York Merchants Review*. "Everybody ought to know that the very best thing he can do is to eat apples just before going to bed. The apple has remarkably efficacious medicinal properties. It is an excellent brain food, because it has more phosphoric acid in easily digestible shape than other fruits. It excites the action of the liver, promotes sound and healthy sleep, and thoroughly disinfects the mouth. It helps the kidney secretions and prevents calculous growths, while it relieves indigestion, and is one of the best preventatives known for diseases of the throat. No harm can come to even a delicate system by the eating of ripe and juicy apples before retiring for the night."

WALNUT HULLS.—Referring to the utilization of waste material in the garden and farm, the *California Fruit Grower* has the following interesting note regarding the husks or hulls of the English Walnut:—"A prominent walnut grower of Ventura County has been requested to put a price on his walnut husks, and is now drying a few hundred pounds for an experimental shipment. The would-be purchaser expects to use the husks for dyeing purposes. Like the husk of the butternut and the black walnut, the outer covering of the California walnut stains the hands a rich glossy brown, which is found a very fast color by the enquiring mind pursuing investigation in this avenue of research. If this waste product can be utilized for such a purpose, it will form a notable addition to that class of economic processes, which reclaim waste and refuse material and adapt it to new and practical uses."

FIRE BLIGHT IN THE PEAR.—A correspondent inquires what part of the world that first sent to America the great scourge of the pear grower—the fire blight—which will destroy the main portion of a large tree in a few days. The vicious little organism that causes the trouble is probably of American origin, and it may be assumed that before the pear was introduced to this continent, the little parasite had for a host plant some species that did not suffer to the extent the pear suffers, and hence escaped observation. It has been known to pear growers for several generations past. The proprietor of Bartram Gardens, writing to Loudon (see Vol. VIII of Loudon's *Gardeners' Magazine*) notes that Bartram's Petre Pear is free from this blight. But we now know that all kinds are liable to it.

OLD PEAR TREES.—Indiana and Illinois claim that they have the oldest pear trees in the West in their respective States. There is one near Springfield, Ill., known locally as the great Sudduth pear tree, which is 50 feet in height and 10 feet in circumference. It is said to be 50 years old. This does not begin to compare with some of the old pear trees planted by the early German and Swedish settlers in the vicinity of Philadelphia, but it is remarkable for a country settled so comparatively recently as what was but a few years ago known as the "far west."

TOKAY GRAPES.—Flame-colored Tokay, or California grapes, were offered in immense quantities in Philadelphia during September and October. The street vendors had quite good material at 10 cents a pound, and the higher grades in the fruit markets were rated at 15 and 20 cents per pound. Some of our earlier native grapes were in competition with those of the European race, and found many to prefer them.

THE LEEK. — Those who have charge of restaurants report a growing request for stewed onions. If this taste is really growing, the leek ought to come into more general demand. The flavor is much more delicate than that of the onion,—and some contend that, when every part of the green foliage is removed, a good dish of stewed leeks is preferable to the best asparagus.

LETTUCE.—With the exception possibly of the cabbage, few vegetables require as rich soil in order to get the best results as lettuce. Many vegetable plants are not particular as to the quality of the manure. Anything in abundance will do,—but the lettuce seems to prefer rank, partially-rotted manure to any other kind. We have seen it thriving in the rich soil of a greenhouse where it was used as a "first crop."

BIOGRAPHY AND LITERATURE.

LIVING MONUMENTS.

Let dead names be eternized by dead stone,
Whose substance time cannot increase nor mar;
Let living names by living shafts be known,
That feel the influence of sun and star.
Plant thou a tree, whose griefless leaves shall sing
Thy deed and thee, each fresh, unfolding spring.

—Edith M. Thomas.

Boissier, Trimen and Trecul.—The *Gardeners' Chronicle*, of October 24th, has biographical sketches of these three eminent botanists. Edmund Boissier died in 1885,—but a catalogue of the living plants in his wonderful garden at Valleyres, at the foot of the Swiss Jura, has only just been published. Dr. Henry Trimen was for a time editor of the *London Journal of Botany*, but went a few years ago to take charge of the Botanic Garden at Peradenya, in Ceylon, and was engaged in a Flora of the Island at the time of his death, on the 16th of October, in his 53d year. Auguste Trecul was famous years ago in anatomical and physiological botany. Early in the century, he traveled for the French government as botanical collector in the Rocky Mountains, Texas and Mexico,—but his collections were lost by shipwreck. He was a member of the French Academy of Sciences. His death is just announced in his 78th year.

Egandale, Chicago.—A note in regard to Dr. Egan's services, as one of the pioneer horticulturists of Chicago, recently appeared in Meehans' Monthly. A recent article in a daily paper, furnished by Mr. F. F. Brown, in a discussion over naming a public school in his honor, gives additional particulars concerning him. He says:

"The new school should by all means be called the Egandale School. The name is historic. Until recent improvements had changed its character, there was no region around Chicago more picturesque or better known. Nowhere was there a finer bit of nature. Dr. Egan had laid out an elaborate system of winding roads, covering many miles, and bordered by fine hedges, some of which are still standing. The beautiful groves, many of which had been planted by him, were filled with an astonishing variety of rare birds; and the ground was covered with patches of violets and innumerable wild flowers. Here was the favorite resort of the botanist, the bird-lover, and the artist. Everyone who has known this once lovely region has felt a debt of gratitude to Dr. Egan, to whom its beauty was so largely due; and now that its character is changing under the advance of city improvements the perpetuation of its founder's name in the way proposed is at once a graceful and fitting tribute. The place is, and has been for forty years, Egandale; and any school built there must logically and appropriately be called the Egandale School."

Baron Ferdinand Von Mueller.—This distinguished Australian botanist, a sketch of whose valuable work with portrait appears in No. 12, Vol. V., of Meehans' Monthly, died on the 9th of October, at Melbourne, as the cable informs us. Thus has passed away one of the most intelligent and practically useful botanists of the present generation. He was born in Germany in 1825, but has been many years a resident of Australia with the development of which his name will be forever conjoined.

Resignation of Editor Wm. Falconer.—The horticultural world will doubtless be surprised and sorry to hear of Mr. Falconer's resignation as Editor of *Gardening*, a position which he has ably filled since our contemporary's commencement. As is well-known, he was not long since appointed superintendent of Pittsburgh's great Schenley Park, which is yet in a youthful stage. The work of developing this large tract of 450 acres, naturally claims his closest attention and occupies all his spare moments, including his evenings which were heretofore devoted to his editorial work.

Honor to a Rose Grower.—It is said that Mr. F. G. L. Bruant, of Pontiers, France, the originator of that beautiful rose Madame Georges Bruant, has been appointed a Chevalier of the Legion of Honor in honor of his services to floriculture. He is said to be an improver of flowers in many directions. Americans would be glad to know of the distinction conferred upon him, if only for the production of the rose already cited, for it is one of the most valuable additions to the list of shrubs for American gardens that has ever been introduced. It blooms twice a year, the August blooming being, if possible, more abundant and showy than the blossoms of its spring season. On the writer's grounds, there is a little bush about 4 to 5 feet in height and nearly as wide, which attracts general attention during August and September.

Fungoid Diseases.—It is a good subject for literary criticism whether our Department of Agriculture at Washington, and other authority equally eminent, should continue the use of the phrase "fungoid disease," which was long ago shown in the old *Gardeners' Monthly* and elsewhere to be without meaning. The termination "oid" to words simply stands for that which is similar. The fungoid disease therefore should mean the disease which is similar to a fungus, but that is not what is intended. They mean disease which is caused by fungus, and not a disease which is similar to a fungus. When the *Gardeners' Monthly* first called attention to the inappropriateness of the phrase, it was dropped for a time,—but, under the encouragement of those to whom we look up to as leaders, it is getting to be a common phrase again.

Sweet Pea Review,—by Sunset Seed & Plant Co., San Francisco, Cal. A neat little booklet of 32 pages designed as a review of the more prominent Sweet Peas in present cultivation. To say the least, it is extremely complete in its details, even to the illustration of the various types. The "Sunset Co" claim considerable experience with Sweet Peas, and this little booklet is compiled from their own investigations. To any one interested in this popular flower it cannot fail to be a source from which a fund of valuable information may be gained.

Local Names.—A correspondent suggests that it would be desirable if some one with a knowledge of English peasantry would collect the local names of British plants before peasantry, as a class, is driven out by the advance of general education. These names, he thinks, would often furnish clues to the uses plants have been put. He says, in South Hampshire, when he was a boy, over half a century ago, the fruit of the hawthorn was known as "Hagales," but he finds no reference to the name now in any popular work.

The Timber Pines of the Southern United States, by Dr. Chas. Mohr,—published by the Division of Forestry of the United States Department of Agriculture. Possibly nothing that anyone may desire to know in regard to the timber pines of the Southern United States, but may be found here. As a specimen of patient, careful and intelligent industry, no work exceeds it. It is a monument Dr. Mohr may be proud to have built for himself,—and does great credit to the United States Government.

Early History of the Mistletoe.—Modern evolutionists believe that the habits of plants, in a great measure, are an outgrowth of the plant's environment,—and from this starting plant, the history of parasitic plants has a peculiar interest. Plants allied to our mistletoe are among the fossils in the Miocene and Eocene formations. If they acquired their parasitic habits, it must have happened very early in the history of the earth.

Amos O. Osborne.—A zealous lover of flowers, Amos O. Osborne, of Waterville, New York, passed away on the 27th of September, in his 85th year. He died in the city in which he was born. By profession, a lawyer, he gave all his spare time to those studies which are connected with rural affairs. He was a man of public spirit, and was chiefly instrumental in the formation of the beautiful Waterville Cemetery.

Prang's Calendars.—Prang's Calendars ornamented with pansies, violets and other pleasant reminders of green fields and flowery woods, are healthy ornaments to hard office life. They have always been popular, and the present effort is among the best of the series.

GENERAL NOTES.

GOLDEN GATE PARK, SAN FRANCISCO.—For all the difficulties surrounding the administration of public parks, quite as many seem to get under intelligent and successful management as those of Europe. Golden Gate Park, at San Francisco, is one which secures frequent commendation from visitors and the public press. It is under the charge of Mr. M. H. Dunn. In these grounds are, carefully cared for, numbers of the *Pinus insignis*,—a beautiful pine which will soon cease to exist in a wild form anywhere. Aquatics are also an especial feature in the gardening.

GENEVA NURSERIES.—There are numbers of first-class nurseries in Geneva, New York, but one to start the boom and probably the oldest is that of William and Thomas Smith. It started with a few acres in 1846, the main line being fruit trees, for which that part of our country has been found especially favorable. It has now five hundred acres under nursery culture. The Maxwell Brothers must have been nearly contemporary with the Smiths, but we have no exact date. Like the latter, they have an enormous acreage under cultivation, and have been eminently successful.

PRESERVING CUT FLOWERS.—In olden times, much thought was given to growing flowers for cutting which would keep sometime after being cut. The Camellia was popular on that account, and the different forms of Bouvardia were also popular for the same reason. These flowers have lost, in a great measure, their great popularity. The carnation, now so popular, is one of the class which keeps in good condition for considerable time after cutting. It is not, however, generally known that if flowers, after being cut, are placed for a few hours with their stems in cold water, in a comparatively cool place, will preserve their freshness when placed in a warm room much longer than without this process. Roses, especially if cut and placed in decorative positions at once, soon wilt; but if cut and placed in water in a cellar for a few hours before being brought to the full light, they will continue fresh for double the time they otherwise would.

MOTIVE POWERS.—In days long ago, and when many of us were young, the only motive power known that could be generally employed was obtained from wind-mills. With the introduction of other motors, wind power has been allowed to go to waste. Recently, however, attention has been drawn to the value of this motor in our garden operations. We frequently find, in climates where rains are in a measure irregular, that the flow of water at our hands would be desirable, and wind-mills are just the thing for getting this remedy to our hands. In like manner, motors may be constructed by the aid of currents of water flowing through our gardens, and in many other ways we might avail ourselves of the motive forces of nature which we find everywhere around us and going to waste. Very much more might be accomplished in this line than we have already expressed.

THE CLEMATIS DISEASE.—Many Clematis growers unfortunately know that the beautiful variety Jackmanni is liable to die off suddenly by an attack of a fungus near the root, which sends its ferment through the whole upper portion in precisely the same manner that fire blight does in trees. This seems to occur more frequently when the plants are about one or two years old. It would be very interesting to know whether any one who has a plant older than three years that has suffered. If it be a fact that the disease is entirely confined to these young plants, it would be encouraging to lovers of this fine flower to replant when one has died. There is scarcely anything more beautiful than this variety of Clematis, and many growers would not mind planting a few times, if they felt sure that after reaching a certain age the plant would have immunity. As with the Fire Blight, no sure preventive has yet been made known.

SITUATIONS WANTED.

Advertisements under this head, not exceeding 50 words, will be inserted once for 50 cents, or three times for $1.25.

GARDENERS:—We shall be glad to furnish names of competent gardeners adapted to large or small places. Gardeners wishing situations should correspond with us. THOMAS MEEHAN & SONS, Nurserymen, Germantown, Philadelphia.

GARDENER—Situation wanted by a man thoroughly experienced in all branches. Age 38, married, 2 small children. Excellent references. Address, J. W. B., care of MEEHANS' MONTHLY

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HEAD GARDENER—Position wanted on private place by practical Scotchman, 30 years old, married, no children, thorough experience in every branch. Highest recommendations. Address, W. A., care of MEEHANS' MONTHLY.

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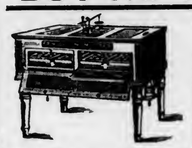

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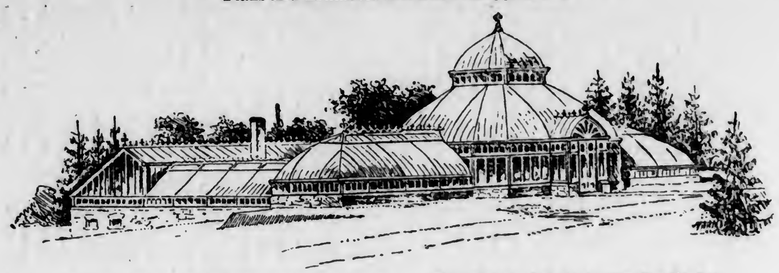

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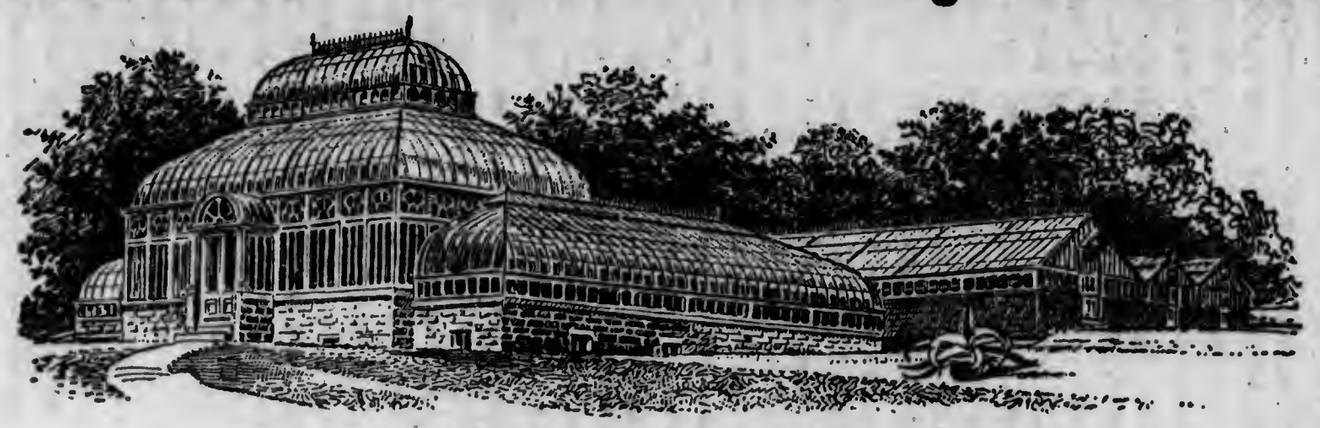

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